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DESCRIPTIVE CATALOGUE

OF

MARIANNE NORTH'S PAINTINGS.

THE GALLERY
OF
MARIANNE NORTH'S PAINTINGS
OF
PLANTS AND THEIR HOMES,
ROYAL GARDENS,
KEW.

DESCRIPTIVE CATALOGUE.

COMPILED BY

W. BOTTING HEMSLEY, A.L.S.

THIRD EDITION.
(WITH CORRECTIONS AND ADDITIONS.)

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HENRY MORSE STEPHENS

CP.

PREFACE.

THE unique collection of Paintings, of which the following pages contain an instructive Catalogue, is, together with the Gallery in which it is placed, a free gift to the Royal Gardens on the part of the accomplished Lady-artist and traveller whose name the Gallery bears. The pictures were painted by herself, on the spot, in the countries indicated; and were arranged by herself in the positions which they occupy; and both the preparation and printing of the Catalogue are due to her munificence.

On the beauty of the collection it is unnecessary to dwell, and it is not possible to overrate its interest and instructiveness in connection with the contents of the Gardens, Plant-houses and Museums of Kew; visitors may, however, be glad to be reminded, that very many of the views here brought together represent vividly and truthfully scenes of astonishing interest and singularity,

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and objects that are amongst the wonders of the vegetable kingdom; and that these, though now accessible to travellers and familiar to readers of travels, are already disappearing or are doomed shortly to disappear before the axe and the forest fires, the plough and the flock, of the ever advancing settler or colonist. Such scenes can never be renewed by nature, nor when once effaced can they be pictured to the mind's eye, except by means of such records as this Lady has presented to us, and to posterity, which will thus have even more reason than we have to be grateful for her fortitude as a traveller, her talent and industry as an artist, and her liberality and public spirit.

The architect of the building (which may be described as classical, and the principal feature of which is the gallery 50 × 25 ft.) is Jas. Fergusson, Esq., F.R.S., who, actuated by the same generous spirit as his friend the donor, gave the plan and supervised every detail of its construction.

J. D. HOOKER, DIRECTOR.

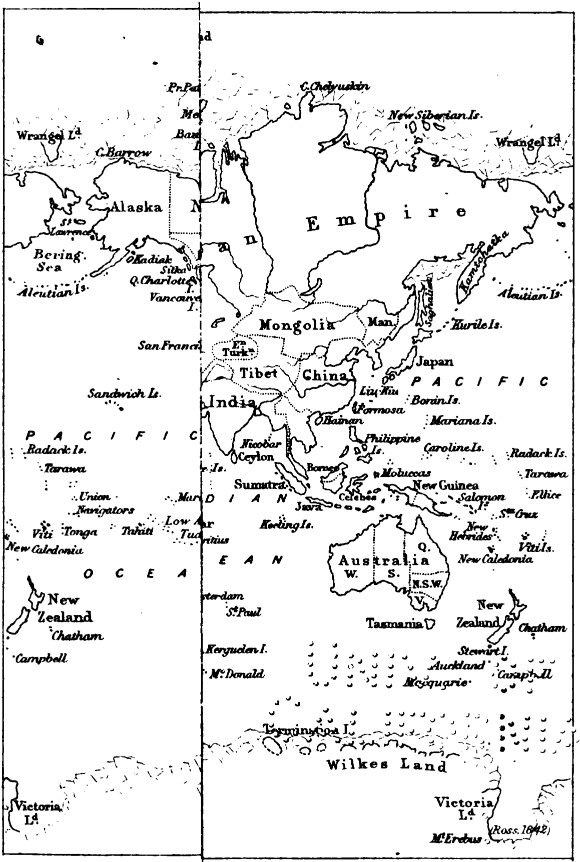
ROYAL GARDENS, KEW.
June 1, 1882,

MAP.

MAP OF THE GEOGRAPHICAL DISTRIBUTION OF VEGETATION IN THE CENTRE OF THE ROOM.

By TRELAWNEY SAUNDERS, *Geographer*,

It has for its basis the principal features of both land and water. The continents and islands which form the land are carefully drawn with their mountain systems and inland waters. Upon this foundation, the broadest aspects of the vegetation are distinguished by various harmonising tints. No names appear, but a few numerals are inserted to seçure the identification of the tints with the explanatory reference at the bottom of the map. The following are the characteristic features thus indicated :—1. The Tundra, or Swampy Plains skirting the Arctic Ocean, and having a prevailing growth of Lichens and Mosses. 2. Woods and Cultivated Ground. 3. Steppes. 4. Bush. 5. Savannahs and Light Forests. 6. Deserts. On the oceans are displayed the great currents, the pack and drift ice, and noted fields of seaweed.



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CATALOGUE

OF

MISS NORTH'S PAINTINGS.*

1. **The Great Water Lily** (*Victoria regia*, Lindl.). This majestic Water Plant inhabits many of the rivers of the north-eastern part of South America. It was first discovered at the beginning of the present century by Father La Cueva and the botanist Haenke, and it was first successfully introduced and cultivated in this country in 1849. The picture was not painted from nature, but from Fitch's splendid illustrations, and done in the fogs of a London winter assisted by the memory of its magnificence in many tropical gardens. The leaves are of enormous size, often over six feet across, and have upturned rims four or five inches high, so that the Indian mothers, who go down to the rivers to wash, place their babies on them with perfect safety. In the right-hand corner a portion of the under side of a leaf is shown. When the flowers first open they are of a pure white, but on the second day they are tinged with rose, which deepens with the age of the flower.

2. **Common Tobacco** (*Nicotiana Tabacum*, L.). A plant belonging to the same family as the Potato. Several other kinds of tobacco are cultivated, but this kind furnishes a very large proportion of the tobacco smoked in Europe and America. It is now nearly four

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* Catalogue of the woods below the paintings, pp. 119–134.

centuries since Columbus landed in America, where he found the inhabitants commonly smoking tobacco; and the practice was soon adopted in Spain, though it seems that nearly a century elapsed before it was introduced into England, where, as well as in other countries, the authorities tried in vain to stop it. At the present time tobacco is the most universally used vegetable product, being consumed alike by civilised and uncivilised races in every part of the world, and duties on it are a chief source of revenue in many countries.

3. **Study of Olives** (*Olea europæa*, L.), painted in Italy. The olive is a tree of very slow growth, and is usually small; but it attains a great age, and some of the very old trees have trunks of enormous girth. It has been cultivated in the countries bordering the Mediterranean from time immemorial, and the oil obtained from the fruit is there an important article of food, besides being extensively used in cooking other articles, whilst in this country it is only eaten with salads, preserved sardines, and such things, though large quantities are used in the arts and manufactures. Panels 3 and 13 below are specimens of the wood.

4. **View from La Paz**, Teneriffe. The Cactus-like plant on the rocks in the foreground is *Euphorbia canariensis*, L. The fleshy-stemmed species of *Euphorbia* differ from the true *Cacti* in having a milky sap and quite small inconspicuous flowers. The same plant is painted on a larger scale in 33.

5. **View in the Cochineal Gardens** at Santa Cruz, Teneriffe. Women taking off the rags in which the newly-hatched insects (*Coccus cacti*) are pinned to the Cactus plants (*Opuntia Tuna*, Mill). After being left a few days the insects attach themselves to the plants, and

no longer need the rags. The Cochineal insect is reared in large quantities in Brazil, Mexico, and the Canary Islands, for the sake of its crimson dye.

6. **A Dragon Tree** (*Dracæna Draco*, L.) in a garden at Santa Cruz, Teneriffe. The thick protuberances below the point where the branches are given off are air-roots; they are represented natural size in 32. Look at the description of 10.

7. **View of Sitio del Pardo**, Orotava, Teneriffe. The succulent plants on the rocks in the foreground belong to the genera *Kleinia*, *Aloe*, *Euphorbia*, *Opuntia*, &c. Plants having thick, fleshy stems or leaves constitute a predominating feature in the vegetation of the coast region of Teneriffe.

8. **Study of Chinese Bananas** (*Musa chinensis*, Sweet) and Bamboos (*Bambusa*, sp.) Teneriffe. The Banana is essentially a tropical type of the vegetable kingdom, and a glance around this gallery will give an idea of how widely spread it now is in warm countries, and what a striking object its noble foliage is in almost every scene and landscape. There are other species of the genus, notably *M. sapientum*, L., described under 134. The young fruit of *M. chinensis*, Sweet, is represented in 239.

9. **Barranca de Castro**, Teneriffe, with Tree Heather, Laurels, Goats, and Shepherds in blankets and topboots.

10. **Dragon Tree** in the garden of Mr. Smith, Teneriffe. The Dragon Tree, or more correctly the Dragon's Blood Tree (*Dracæna Draco*, L.), is a native of Teneriffe, and is one of the most celebrated trees in the annals of natural history, for until within a few years ago there stood at Orotava a gigantic specimen of it that had

scarcely increased in size since it was first described by the navigators of the early part of the fifteenth century. This tree was about seventy-five feet high, and its trunk about seventy-eight feet in girth, and quite hollow for a long time preceding the destruction of the tree by a storm in 1867. It was formerly supposed by Humboldt and others that this tree lived to a very great age; but from what is now known of its rapid growth when young, it seems likely that the trunk attains its full size in a much shorter period even than the tree lives after this has taken place. Very little, if any, of the concrete resinous juice is now used in this country, the Dragon's Blood of commerce being the product of a palm (*Calamus*, sp.). See 37.

11. **View of the Peak** from the bridge at Icod, Teneriffe; Bananas and Date Palms in the foreground.

12. **Dragon Tree** at San Juan de Rambla, Teneriffe.

13. **Twining Plant** (*Dipladenia*, allied to *D. crassinoda*) and Butterfly (*Morpho achillæna*), Brazil.

14. **View in the Garden of Acclimatisation**, Teneriffe. The plant with yellow flowers in the left corner is a species of *Sonchus*, behind which rise the crimson spikes of an *Aloe;* and at the back is a fine American *Wigandia*, with broad leaves and large clusters of blue flowers. In front of the cypress, on the right, is an American *Yucca* in blossom.

15. **View of Icod**, with Reeds (*Arundo Donax*, L.) on the high ground to the left, and Cochineal Gardens below, Teneriffe.

16. **Old Manor of Castro**, Teneriffe, with Tree-Heath (*Erica arborea*, L.) and Cinerarias (*Cineraria cruenta*, L.) in blossom. This is the wild parent of the many-

coloured varieties of Cineraria grown in greenhouses in this country.

17. **Pomegranate** (*Punica Granatum*, L.) Flowers. Painted in Teneriffe. The pomegranate is a native of North-Western India; but, as in the case of most plants that have been cultivated from remote times, it is difficult to determine where it is really indigenous. Its fruit is valued in hot countries on account of the refreshing property it possesses.

18. **Abyssinian Ensete** (*Musa Ensete*, Gmel.) in a garden in Teneriffe. This is the most ornamental of the genus, but its fruit is not eatable. It was first discovered by Bruce more than a century ago; and seeds of it were sent to Kew in 1853 by Walter Plowden, British Consul at Massowa. Like the Banana, it flowers only once, and, unlike that, it is several years before it flowers.

19. **View of the Peak of Teneriffe** with Cacti (*Opuntia*) and other succulent plants in the foreground; the candelabrum-like inflorescence on the right belongs to the American Aloe (*Agave americana*, L.).

20. **Aloe** (*Aloe vera* L., syn. *A. vulgaris*, Lam. and *A. barbadensis*, Mill.) and Cochineal Cactus (*Opuntia Tuna*, Mill.) in flower, Teneriffe.

21. **A Plant of the Arum-family** (*Dracunculus canariensis*, Kunth) and Cinceraria in flower, Teneriffe.

22. **Cherokee Rose** (*Rosa lævigata*, Michx., a native of Georgia, North America,) and semi-double pink Damask Rose: the Peak of Teneriffe seen in the distance.

23. **A Species of Bugloss** (*Echium simplex*, DC.), Teneriffe. A stately herb about six feet high.

24. **View of Puerto de Orotava,** Teneriffe, from the Sitio del Pardo, with top of a Date Palm (*Phœnix dactylifera,* L.) in the foreground. The Date Palm, though cultivated in Southern Europe and Western Asia, is really more at home in North Africa, where it affords the principal food of a large population. It is the Palm of the Oases, and supplies not only food for man and beast, but, like many other members of the same family, a variety of other useful articles. This and the still more valuable Cocoanut Palm have plume-like leaves, contrasting with the fan-shaped leaves of many others. The male and female flowers of the Date Palm are borne on separate trees, so that under cultivation it is only advantageous to propagate them from offsets, by means of which the sex is ensured and the variety is kept pure—for there are many varieties. The trees grow from sixty to eighty feet high, and live to a great age, producing a large crop of fruit every year. It is wild in some of the Canary Islands, and grows in some parts in company with *Pinus canariensis.*

25. **View of the Corcovado Mountain,** near Rio de Janeiro, Brazil, with Bamboo, Royal Palms (*Oreodoxa regia,* H.B.K.), &c.

26. **Harvesting the Sugar-Cane** (*Saccharum officinarum,* L.) in Minas Geraes, Brazil. The solid stems grow ten, or even as much as fifteen, feet high, and the sugar-juice is expressed from them by machinery. The harvest is always a festival for men and beasts, the latter growing very fat on the refuse and young green leaves. Formerly cane-sugar was the only, or almost the only, kind of sugar consumed in Europe, as well as in tropical countries where it is cultivated; but now enormous quantities of sugar are extracted from the

beet-root, cultivated in France and Germany and other Continental countries.

27. **A Tropical American Water Plant** (*Eichornia azurea*, Kunth) growing in the Lake of Lagoa Santa, Brazil, where it was planted by Dr. Lund, a Danish Naturalist.

28. **Orchids and a Creeper** growing on Water-worn Boulders in the Bay of Rio Janeiro, Brazil. The creeping plant at the top is *Codonanthe Hookeri*, Hanst., syn. *Hypocyrta gracilis*, Mart.; the large-flowered Orchid is a species of *Cattleya*, and the yellow-flowered one in the lower right-hand corner is apparently an *Epidendrum.*

29. **A Melastomacea** (*Miconia*, sp.), and a climbing Composita (*Mutisia speciosa*, Ait.) on the left, associated with Butterfly (*Morpho laertes*), Brazil. The *Melastomaceæ* are very numerous and varied in tropical America; and most of them are easily recognised by having three, five or more prominent ribs running lengthwise in their leaves, and by having curious appendages to their stamens.

30. **Glimpse in a Glen at Gongo,** Brazil. The dark flowers in the background are those of some Melastomacea (*Pleroma*, sp. ?), see 83; and the yellow ones belong to an *Aspilia* (see 58).

31. **A Brazilian Orchid** (*Sophronitis grandiflora*, Lindl.). It is cultivated in this country.

32. **Cluster of Air-roots of a Dragon Tree,** Teneriffe. These thick air-roots gradually grow downwards and cover the whole trunk which has been gashed and hacked by the collectors of Dragon's Blood.

33. **A Cactus-like Plant** (*Euphorbia canariensis*, L.) growing close to the sea in Teneriffe. This singular

shrub forms a characteristic feature of the vegetation of the lower zone in the Canaries.

34. **Houseleek and Canary-birds** (*Serinus canarius*), in Teneriffe. Several kinds of Houseleek (*Sempervivum*, spp.) are very common on roofs and rocks and other dry situations, in the Canaries.

35. **Common Aloe** (*Aloe vera*, L.) in flower, Teneriffe. The rocky slope covered with a dense thicket of the same plant, which is a native of South Africa. Aloes or Bitter Aloes is the dried juice of this and other species of the genus (see 20).

36. **Group of Flowers**, painted in Teneriffe. The cactus (*Opuntia Dillenii*, Haw.) lying in front of the vase is cultivated for its spines, which are used to fasten the bags of cochineal insects to another kind of cactus, on which the insects feed (see 5). The birds are *Agapornis pullaria*. The reddish bell-shaped flowers are those of *Canarina Campanula*, L., a plant peculiar to the Canary Islands; and the showy violet-blue flowers are apparently those of an *Iochroma*, an American genus of *Solanaceæ*.

37. **Dragon Tree** at Orotava, Teneriffe. This is the largest descendant of the famous tree of which a short history is given under 10.

38. **View at Morro Velho**, Brazil, with a Yucca and the candelabrum-like American Aloe (*Agave americana*, L.) in flower in the foreground. This should not be confounded with any of the species of the genus *Aloe* (see 20 and 35), all of which are natives of the Old World, and chiefly of South Africa.

39. **A Brazilian Epiphytal Orchid** (*Sophronitis coccinea*, Rchb. f.).

40. **View of the Sugarloaf Mountain,** from the Aqueduct Road, Rio Janeiro; a Sloth feeding on a Trumpet Tree (*Cecropia peltata,* L.) in the foreground. The Trumpet Tree is so called because its hollow branches are used by the natives of South America to make musical instruments.

41. **Group of Sago-yielding Cycads** (*Cycas* sp.) with Date Palms (*Phœnix dactylifera,* L.) behind, in the Botanic Garden at Rio Janeiro. In the right foreground is a trunk of a Camphor tree with Vanilla growing thereon.

42. **Some Fruits and Vegetables** used in Brazil. In front the Ochro (*Hibiscus esculentus,* L.), the seed-vessels of which are used in thickening soups; the Guianga, a myrtaceous fruit, with a kind of pumpkin called Borbora, and flowers and tuber of Sweet Potato (*Ipomæa Batatas,* Lam.) behind.

43. **View near Tijuca,** Brazil, with Granite Boulders in the foreground. The plants in the foreground are overrun by a species of Dodder (*Cuscuta americana,* L.), from which an orange dye is obtained. A similar parasitical plant often preys on clover in this country.

44. **The House-builder Caterpillar,** on a Gesneraceous shrub, Brazil. This industrious creature weaves together sticks and leaves and makes itself a perfect covering, in and out of which it can move its head quickly at the slightest alarm or interruption of its usual occupation of eating every young twig and leaf within its reach. It hangs its house to the branches by temporary ropes, and takes care to secure itself by a fresh one elsewhere before it breaks the old ones and jerks itself to new feeding-ground. After three weeks

of such wandering, it goes into the usual sleep of a chrysalis and awakes a most dowdy moth, the female having absolutely no wings.

45. **Two Tropical American Flowers.** The one having white flowers (*Utricularia montana*, Jacq.) is a congener of the Bladderworts of our ponds and ditches. It has a wide range of distribution. Associated with it is the pretty little Brazilian *Stenogaster concinna*, Hook. f.

46. **A tall Brazilian Climber** (*Aristolochia brasiliensis*, Mart. & Zucc. var.). The strangely-formed, veined flowers have a very unpleasant smell. This plant is cultivated in the Palm House, where it flowers profusely almost every year.

47. **Flowers of** *Cassia corymbosa*, Lam., a forest tree whose twin leaflets close together at sunset. The insects (*Phasmidæ*) are called Leaf Insects (see 498), on account of the close resemblance of their wings to leaves. The genus *Cassia* is numerous in species which are widely dispersed in warm countries. Other species are represented in 277, 302, and 520 of this collection.

48. **View in Mr. Moritz's Garden at Petropolis,** Brazil: Vines, Peaches, Bamboos, and Bananas.

49. **View of the Jesuit College of Caracas,** Minas Geraes, Brazil, with Coral Trees (*Erythrina*, sp.) in flower in the foreground. The College is at an elevation of about 3,000 feet above the sea level, and nine priests educate about 200 of the most intelligent boys of the surrounding country.

50. **View with Oil Palms** (*Elæis guineensis* ?), Cacti (*Cereus* sp.) and Papaw Tree (*Carica Papaya*, L.) in the foreground. The figure on the left is the Papaw, which is also shown in 105 and its fruit in 522.

51. **Flowers and Fruit of the Maricojas Pàssion-flower** (*Passiflora alata*, Ait.), Brazil. The fruit of this and several other species of the genus is edible. It bears the name Granadilla in Central America. See 126.

52. **A View in the Botanic Garden,** Teneriffe.

53. **Orange Flowers and Fruits,** painted in Teneriffe. The Orange (*Citrus Aurantium*, Risso) is cultivated in many parts of the South of Europe, and in other countries bordering the Mediterranean Sea. Formerly a very large proportion of those eaten in England came from the Azores. Two hundred shiploads, it is stated, were annually exported from the Island of St. Michael alone; but of late years the orange trade has declined, and pine apples are now largely grown in their place. Under favourable conditions orange trees are exceedingly productive. Wallace mentions one in St. Michael's that bore 20,000 fruit in one crop. It is supposed that the orange, lemon, citron, &c., were all originally brought from tropical Asia. Panel 2 is Lemon-tree wood.

54. **Boulders, Fisherman's Cottage and Tree** hung with Old Man's Beard, Long Moss, or Air Plant (*Tillandsia usneoides*, L.), at Paquita, Brazil. The Tillandsia is a member of the *Bromeliaceæ* (see 153 and 246), and is very common in America from the southern United States southward to Uruguay and Chili. When out of flower, it looks more like a coarse moss or lichen than a flowering plant.

55. **Indaia Palm** (*Attalea* sp. ?) at Sette, Lagoa, Brazil.

56. **Flor Imperiale** (*Hæmanthus multiflorus*, Mart.), Coral Snake (*Elaps*, sp.) and Spider. Brazil.

57. **Tijuca**, Brazil, with a Palm (*Cocos*, sp.) in the foreground.

58, **Some Brazilian Flowers.** A white-flowered *Convolvulacea*, associated with a species of *Dipteracanthus* —a shrub smelling like onions, and a yellow-flowered *Composita* (*Aspilia* ?), that smells like vanilla.

59. **Scene in Mr. Smith's Garden**, Teneriffe. An arbour covered with the Cherokee Rose (22), and *Bougainvillea* (122) creeping over Cypress and Myrtle trees.

60. **Red and White Indian Water Lilies**, with the large white flowers of *Solandra* ? and the crimson flowers of an Australian shrub (*Calothamnos*, sp.) from the Botanic Garden, Rio, Brazil.

61. **Flowers** of *Datura arborea*, L., and Humming Birds (*Lampornis* sp.), Brazil. The Datura is a native of tropical America, and is commonly cultivated in other countries, as it grows like a rank weed. It is better known in English greenhouses under the name *Brugmansia arborea*, Pers. See 146, 241, and 511. The leaves are smoked to cure asthma; and the Greeks use them to procure pleasant dreams.

62. **Palm Trees and Boulders** in the Bay of Rio, from Paquita, with the Organ Mountains in the distance. Brazil.

63. **Trees laden with Parasites and Epiphytes** in a garden, Brazil.

64. **Landscape at Morro Velho**, Brazil. In the foreground is a colony of Butterflies (*Heliconius phyllis*) going to roost on a single segment of a palm leaf, from which they will never move until the sun's rays reach

them in the morning. This insect has a powerful musk-like scent by which the artist often found her way to it.

65. **Foliage and Flowers of a Zingiberaceous Plant** (*Amomum magnificum*, Benth.; syn. *Alpinia magnifica*, Roscoe), and Flowers of an Orchid (*Oncidium* sp.), Brazil.

66. **The Canary Islands Pine** (*Pinus canariensis*, Ch. Smith), at Icod, Teneriffe. The vegetation of the Canary Islands presents some strange anomalies, not the least interesting of which is the pine associated with the Date palm.

67. **View of the Piedade Mountains**, from Gongo, Brazil.

68. **Cabazina Pears** (*Psidium*?), a rather bitter fruit having a peach-like skin, Brazil.

69. **Brazilian Wild Flowers.** *Vellosia*, sp. (blue), *Xyris*, sp. (yellow), a purple-flowered orchid, and a deliciously-scented epiphite (*Clusia*?), whose scent drew the artist to it.

70. **View under the Ferns at Gongo**, Brazil, with Slave Woman who brought the artist's provisions over eight miles of forest road.

71. **Wild Flowers of Brazil.** The large greenish white flowers with a crimson and yellow centre are those of a shrubby epiphyte (*Clusia* sp.) belonging to the Gamboge family; associated with it is a species of *Sisyrinchium* having indigo flowers, a species of *Oncidium*, the purple-clustered *Periandra dulcis*, and another orchid.

72. **Study of the Traveller's Tree of Madagascar** (*Ravenala madagascariensis*, Sonn.), in the Botanic Garden of Rio. This tree is called the Traveller's Friend, as its broad leaves collect the precipitated moisture which filters into its tightly-plaited sheaths; and a drink of pure water may always be obtained by tapping them. It is a member of the *Musaceæ*, and is described as one of the most striking features in the scenery of the coast region of Madagascar. See the description of 370.

73. **A Brazilian Climbing Shrub** (*Odontadenia speciosa*, Benth., syn. *Dipladenia Harrisii*, Purdie) and Humming Birds (*Lophornis magnificus*). Observe the curious loop-shaped seed-vessel in the upper right-hand corner; the carpels forming it cohere at the base and tip only.

Humming Birds are exclusively confined to the New World, where they are dispersed throughout the country from the extreme south to Sitka in the north; but they are by far most abundant within the tropics. There are many genera, and numerous species; and they present the utmost diversity in form and plumage. They are small or minute birds, some of them not larger than a Bumble Bee, as the *Mellisuga minima* (see 133). Their plumage is often splendid beyond description, yet little of the splendour is seen by man when the birds are alive, because their movements are so rapid. Even when poised under a flower, their wings are in quick motion, causing the humming noise from which they take their name. The English Humming Bird Hawk Moth, and some others, have a similar motion, which has given rise to the error that a species of Humming Bird actually inhabited this country. Bates relates in his "Naturalist on the Amazons" that he several times shot by mistake a kind of Humming Bird Hawk Moth (*Macroglossa Titan*) instead of a bird. Humming Birds live on insects and honey; and it is believed that they as often visit flowers for the insects as for the honey they find in them. It is noteworthy that these birds, or at all events most of them, lay only two eggs in a brood; and, what is more remarkable, the eggs are always white.

74. **Flor de Pasqua** (*Euphorbia pulcherrima*, Willd., syn. *Poinsettia pulcherrima*, Grah.), the very smallest inflorescence the artist could find on a bush at Morro Velho, Brazil. This plant is commonly cultivated in England, but it is not usual to see such large inflorescences, because, as grown for market, the plants are small, bearing only one inflorescence. The flowers themselves are inconspicuous, the showy part being the coloured leaves or bracts surrounding them. In *Euphorbia splendens*, Boj. (183) the bracts are comparatively small. Compare with the inflorescence of *Clerodendron* (361).

75. **Organ Peak** at Theresopolis and Bay of Rio below.

76. **Foliage, Flowers, and Fruit** of *Cyphomandra betacea*, Sendt., syn. *Solanum betaceum*, Cav., painted in Brazil. This plant is a native of Central America, and is cultivated in some countries for its fruit, which is similar to the Tomato in flavour.

77. **Avenue of Royal Palms** (*Oreodoxa regia*, Kth.) at Botofogo, Brazil. This avenue is half a mile long, and the trees, which are about forty years old, are 100 feet high. Five rings are left on the trunks each year by the fallen leaves, one of which is as much as a man

can lift. The Royal Palm is a native of the West Indies, as is also *O. oleracea*, Mart., which is said to attain a height of 170 feet.

78. **Foliage and Fruit** of Mammee Apple or South American Apricot (*Mammea americana*, L.). A tropical American tree of the *Clusiaceæ*, cultivated for its fruit, the outer rind of which is bitter; but the flesh is sweet and aromatic, and is made into preserves. A kind of wine is made from the young shoots, and a scent from the white flowers.

79. **Foliage and Flowers of** *Roupellia grata*, Wall., with Royal Palms (*Oreodoxa regia*, Kth.) and the Sugarloaf Mountain in the background. Brazil. This handsome climbing shrub (*Roupellia*) is a native of Sierra Leone, and its flowers are very sweet-scented. It is occasionally cultivated in this country.

80. **Screw Pines** (*Pandanus*, sp.), and the Avenue of Royal Palms (*Oreodoxa regia*, Kth.) in the Botanic Gardens, Botofogo, Brazil. The Screw Pine to the left in the foreground is a male plant in flower (see 260), and that on the right is a female in young fruit (see 514). For further particulars consult the description of 260.

81. **Flannel Flower** (*Macrosiphonia longiflora*, Muell.) of Catabranca and Butterflies (*Catagramma* sp., on the left, and *Callicore Clymene* on the right). Brazil. Observe the mark 88 on the wings of the butterflies. The Flannel Flower is so called on account of the plant being densely clothed with woolly hairs. It is a member of the *Apocyneæ*, and is remarkable for the very long tube of the flower.

82. **Tree Ferns and Climbing Bamboos** in Gongo Forest, Brazil.

83. **Wild Flowers of Catabranca,** Brazil. The principal figure having longitudinally ribbed leaves and large blue flowers is a *Melastomacea* (*Pleroma,* sp.) with an orange-flowered *Tillandsia* and a species of *Evolvulus* behind.

84. **Palma de Santa Rita,** a kind of Iris (*Marica,* sp.), and Atlas Moth (*Saturnia,* sp.) Brazil. The inflorescences of the *Marica* are so heavy that they fall to the ground on all sides; and the seeds germinate before they leave the pod, and send down their roots therefrom, forming a wide circle of young plants around the old one. The caterpillar of the Atlas Moth builds itself a house from the leaves of this plant. Perhaps the young plants are not developed from seeds, but viviparously from bulblets formed in the inflorescence, as is commonly the case in *Marica gracilis* under cultivation, which may be seen in the Palm House at almost all seasons.

85. **Fan, Palm, Bamboos and India-rubber Trees** in the Botanic Garden, Rio, Brazil.

86. **Flowers of** *Hedychium,* spp., Botanic Garden, Brazil. The species of *Hedychium* are mostly very ornamental plants and their flowers are fragrant. They inhabit tropical Asia. That on the left is *H. chrysoleucum,* Hook., a species cultivated in this country.

87. **Yellow Bignonia** (*Bignonia æquinoctialis,* L.) and Swallow-tail Butterflies (*Papilio thoas*), with a view of Congonhas, Brazil.

88. **The Iron Rocks of Catabranca,** Brazil. They are 5,000 feet above the level of the sea.

89. **View from the Sierra of Petropolis,** with the Bay of Rio, and its Islands, and Sugarloaf Mountain in the distance, Brazil. This summit is 3,000 feet above the sea, and is reached by a zigzag road of ten miles.

90. **Group of Wild Meadow Flowers,** of Brazil, Golden Banana and Euemba's (*Crotophaga major*) Egg. Among the flowers are a species of *Clusia* (?) (large white), a *Pleroma* and *Thunbergia alata,* Boj., yellow with dark centre.

91. **Flowers in the Botanic Garden,** Rio, Brazil. *Bignonia venusta,* Ker., and a *Convolvulacea* (*Quamoclit Nationis,* Hook. ?) climbing over *Luhea rufescens,* St. Hil., a forest tree.

92. **Brazilian Orchids.** A species of *Zygopetalum* (probably *Z. maxillare,* Lodd.) with the orange-scarlet *Comparettia coccinea,* Lindl., in front.

93. **View of the Old Gold Works** at Morro Velho, Brazil.

94. **Cocoera Palms** (*Acrocomia,* sp.) and Bananas, Morro, Velho, Brazil. This Palm is a favourite nesting-place of birds, as its trunk is so armed with prickles that no climbing enemies attempt to reach them.

95. **Brazilian Flowers.** *Begonia maculata,* Raddi, syn. *B. argyrostigma,* Fisch., the blue-berried *Coccocypselum discolor,* Hort., and Blue Bird (*Cæreba cyanea*).

96. **Butterflies' Road** through Gongo Forest, Brazil.

97. **View from Mr. Weilhorn's House,** Petropolis, Brazil.

98. **Brazilian Orchids.** The rosy purple flowers are those of a species of *Cattleya,* which magnificent genus has its head-quarters in Brazil; the other is *Zygopetalum Mackayi,* Hook.

99. **Side Avenue of Royal Palms** (*Oreodoxa regia,* Kth.) at Botofogo, Brazil. See the remarks under 77.

100. **Lagoa de Freitas,** near Rio, Brazil. Cypress and Frangipani (*Plumeria*, sp.) trees in the foreground.

101. **Group of Brazilian Forest Wild Flowers and Berries.** Lying in front, on the left, is a head of the handsome orange-red *Amarantacea* (*Gomphrena officinalis* ?); above it a *Melastomacea* in fruit; the azure blue flowers of a *Stachytarpheta;* the crimson flowers of a species of *Physocalyx*, &c.; and on the right a purple *Convolvuacea* and a white *Bignoniacea.*

102. **Flowers of a Brazilian Forest Tree** (*Pachira marginata*, A. Juss). The genus *Pachira* is related to the Baobab and the genera *Bombax* (261) and *Eriodendron* (454).

103. **Peaches and Humming Birds** (*Petasophora serrirostris*), Brazil. The peach is an introduced fruit in Brazil. It is here represented growing against a mat fence instead of a wall.

104. **Glimpse of Mr. Weilhorn's House** at Petropolis, Brazil. The late owner of this house was a friend of Humboldt.

105. **Papaw Trees** (*Carica Papaya*, L.) at Gongo, Brazil. The Papaw is a tropical American tree now commonly cultivated in warm countries. Its stem is usually unbranched and grows from twenty to thirty feet high, bearing a crown of foliage, beneath which hangs the fruit. The fruit is represented in 522.

106. "**Scotchman hugging a Creole,**" or a Palm in the embrace of the roots of a Fig tree, Brazil. The tree that is now strangling the palm was at first the nurse-child of the latter, and its history is this. A seed was

dropped by a bird among the leaves of the Palm, where it germinated and grew, forming root after root, which descended and spread till they formed an unbroken sheath around its trunk. Soon the Palm will be strangled and die, after which it will fall carrying its destroyer with it. Nests of the Sociable Oriole (*Ostinops* or *Ocyalus*) hang from the tree, and near it is a Giant Ants' nest, the only entrance to which is by a long underground tunnel.

107. **Brazilian Orchids and other Epiphytes.** The Orchids in flower are a species of *Cattleya* and an *Oncidium*, the latter below.

108. **Oil Palm** (*Elæis* ?) at Tijuca, Brazil.

109. **View of the Old Gold Works** from the verandah at Morro Velho, Brazil, with the North American *Magnolia grandiflora*, L., and Pet Animals in the foreground.

110. **Orchid** (*Cattleya*, sp.) and Humming Birds (*Chlorostilbon* sp.), Brazil.

111. **Foliage and Flowers** of a species of *Chorisia* (probably *C. speciosa*, St. Hil.), and Double-crested Humming Birds (*Trochilus* sp.), Brazil.

112. **Flowers of a Coral Tree** (*Erythrina*, sp.) and King of the Flycatchers (*Muscivora Swainsoni*), Brazil.

113. **Flowers of a** *Papilionacea* (*Mucuna* sp. ?), Brazil. These flowers are sweet and of a waxy consistency. They were growing at the mouth of the Cave of Curvelho, where Dr. Lund found the teeth of a "nut-eating man."

114. **Flowers of another Kind of Coral Tree** (*Erythrina* sp.)

115. **Palma Christi or Castor Oil** (*Ricinus communis*, L.), painted in Brazil. Behind are some leafless stems bearing clusters of the prickly seed-vessels at the top. The castor-oil tree is a native of India, but it has long been cultivated in other warm countries, and has become naturalised in many places. It is also grown in this country for the embellishment of gardens and public parks in summer. The oil is extracted from the seeds. The Butterfly is a species of *Pyrameis*.

116. **A Brazilian Orchid** (*Lælia purpurea*, Lindl.). This is one of the handsomest orchids known. It was first cultivated in this country about the year 1852, when Messrs. Backhouse exhibited a plant in flower at one of the meetings of the Horticultural Society of London.

117. **Foliage, Flowers, and Fruit of Poma de Lupa** (*Solanum*, sp.), Brazil.

118. **Foliage Flowers, and Fruit of the Soursop** (*Anona muricata*, L.), Brazil. A native of the West Indies, where, as well as in continental America and other countries, it is cultivated for its excellent fruit.

119. **Buriti Palms** (*Mauritia vinifera*, Mart. ad od Araucaria trees (*A. brasiliensis*, A. Rich.) on the distant ridge. Brazil. The Buriti is one of the most gigantic of palms, and its rich, red and yellow fruit, "like quilted cannon balls," hang in bunches five feet long, and from it flour, wine, and butter are made; and the fibre of the leaves supplies thread for weaving hammocks, baskets, nets, and clothing. Another species of the genus, *M. flexuosa*, inhabits the valleys of the Amazon, Orinoco, and other rivers in north-eastern South America, growing in places that are often inundated. It is an equally tall and robust palm, and the native Indians subsist

almost entirely on its products; and what is more strange, they build their houses high up amongst its leaves, where they live during the floods.

120. **Brazilian Flowers.** On the left the elegant, feathery leaves and crimson flowers of *Ipomœa Quamoclit*, L.; above a scarlet and white *Acanthacea;* in the centre a species of *Tabernæmontana* (?), with the richly coloured foliage of *Iresine Herbstii*, Hook., below, and a blue-flowered *Evolvulus* on the right.

121. **Foliage, Flowers and Seed Vessels** of American Cotton (*Gossypium barbadense*, L.), and Foliage and Fruit of the Star Apple (*Chrysophyllum Cainito*, L.), Jamaica. Cotton was cultivated and cotton fabrics were made as far back as records go in the Old World; and when America was discovered cotton was in general use there. Three species with their varieties yield all the different kinds of cotton of commerce. The North America cottons are the produce mainly of two varieties, long staple and short staple, of *G. barbadense; G. peruvianum* yields most of the cotton grown in South America; and *G. herbaceum*, which is indigenous in India, was the source of all the cotton used in earlier times in the Old World. As may be seen, cotton is the soft down with which the seeds are clothed, whilst flax (linen) is a long fibre obtained from the slender stems of an herbaceous plant.

The dark brown foliage of the Star Apple tree makes it as conspicuous in a landscape as our Copper Beech. Its fruit tastes like blanc-mange.

122. **Foliage and Flowers** of a Brazilian Climbing Shrub (*Bougainvillea*) and Humming Birds (*Clytolæma rubinea*). There are three or four species or varieties of the genus *Bougainvillea*, all of them endemic in Brazil,

though one or two are now commonly cultivated in warm countries, and in the greenhouses of this country. They climb to the tops of tall trees (see 59) and cover them with rosy or rosy-purple festoons. The real flowers are those small bodies of which there are three clustered in each set of three coloured bracts.

123. **Foliage and Flowers** of the Sandal-wood Bramble (*Rubus rosæfolius*, Smith). This elegant Bramble is commonly cultivated in warm countries, and widely spread in a wild state. Leaves sweet-scented.

124. **Night-Flowering Lily** (*Crinum* sp.) and Ferns, Jamaica.

125. **Jamaica Orchids** growing on a branch of the Calabash tree, with a flower of the Calabash (*Crescentia Cujete*, L.). The most interesting of these orchids is the one hanging from the top (*Aeranthes funalis*, Rchb. f., syn. *Angræcum funale*, Lindl.), being as near what might justly be called an Air-Plant as any to which the name is applied. It is quite leafless, and has no pseudobulbs.

126. **Foliage, Flowers, and Fruit** of a Passion-flower or Granadilla (*Passiflora* sp., *P. macrocarpa*, Mast.?), Jamaica. The fruit of several species and varieties of Passion Flower is edible. The part that is eaten is either the fleshy aril attached to the seeds, or the juicy pulp in which the latter are embedded.

127. **Road near Bath**, Jamaica, bordered with Cabbage Palms (*Euterpe*?), Bread Fruit, Cocoa, and Coral trees. Some account of the Cocoa and Bread Fruit trees will be found in the descriptions of 347 and 354 respectively.

128. **Foliage, Flowers, and Fruit** of the Pitanga (*Eugenia* sp.) and Sulphur Butterflies (*Callidyas philea*), Jamaica.

129. **The Aqueduct** of Morro Velho, Brazil, with Coral Mountain in the background, and part of an inflorescence of Banana, a *Convolvulacea* and Amethystine Humming Birds (*Calliphlox amethystina*) in front.

130. **The Bog-walk,** Jamaica, with Bread Fruit, Banana, Cocoa Nut, and other trees.

131. **Scene in Dr. Lund's Garden** at Lagoa Santa, Brazil. The large trunk in front covered with a Cactus (*Cereus*, sp.), a large aroid (*Philodendron*, sp.), and Orchids. On the left a Palm (*Acrocomia*, sp.) with a large mass of *Cattleya* on the lower part of the trunk.

132. **Foliage and Flowers of the Mahoe** (*Paritium elatum*, G. Don), Jamaica. The dark-coloured wood of this tree is most valuable. If not a variety of *P. tiliaceum*, Juss., it is very closely allied to it; and this species is found on nearly all tropical sea-shores.

133. **Foliage, Flowers, and Fruit of the Nutmeg tree** (*Myristica fragrans*, Houtt., syn. *moschata*, Thbg.), and Humming Bird (*Mellisuga minima*) with its nest, Jamaica. This Humming Bird is the smallest known. The genus *Myristica* is rather numerous in species, widely scattered in tropical regions, including America; but the present species is indigenous only in the Indian Archipelago. It furnishes a large proportion, if not all of the nutmegs of commerce. The outer rind of the fruit makes a good preserve; and the inner scarlet wrapper immediately enclosing the nutmeg is the spice called mace. Male flowers and female flowers are produced on separate trees. For the habit of the tree, see 341. The butterfly is *Papilio polydamas*.

134. **Bananas and Orange Trees** in Fruit with a Palm (*Acrocomia*, sp.) behind, and a Bush of *Poinsettia pulcherrima* in the middle, in the Garden of Morro Velho, Brazil. As mentioned under 8, the Banana is one of the most striking types of tropical vegetation; and it is also one of the most important, as its fruit is the staple food of a large number of the human race. There are many varieties bearing edible fruits, and some writers distinguish the Plantain (*Musa paradisiaca*, L.) and the Banana (*Musa Sapientum*, L.), attributing to the latter a purple spotted stem, and a shorter, rounder fruit; but these differences seem to be lost in some of the varieties, hence in this guide all the varieties are called Bananas. The Banana, although arboreous in habit, is herbaceous in character, each stem usually coming to its full growth in less than a year. It grows from ten to twenty feet high, or sometimes higher, and bears only one crop of fruit. When this is ripe, its great weight, often sixty or seventy pounds, brings down the stem that is almost leafless; and the old stems are soon replaced by new ones springing from the same root-stock. As may be seen, it is only the basal portion of the spike that bears fruit; yet the spike goes on growing and producing flowers until the fruit is nearly ripe. But the fruit is not the only useful product of the plant, almost every part of which is applied to some purpose. Next to the fruit, the fibre of the leaf-stalk is the most valuable product. Its quality varies in different varieties, some of it being very fine, from which muslin is made. Another species of the genus, *M. textilis*, Nees, yields the valuable fibre known as Manilla Hemp.

For some particulars respecting the orange, see 53.

135. **A Bank of Guaresma** (*Melastomacea*) and Trumpet Trees (*Cecropia peltata*, R.), Brazil.

136. **Peak of Catabranca,** with its Iron Rocks and Tree Lilies (*Vellozia* spp.) Brazil.

The peak is 5,000 feet high; and the various arboreous species of *Vellozia* are characteristic of this sterile mountain region of Brazil.

137. **Foliage and Flowers** of *Alpinia nutans*, Roscoe, with a pair of Doctor Humming Birds (*Aithurus polytmus*), Jamaica.

138. *Leonotis nepetæfolia*, R. Br., and Humming Birds (*Aithurus polytmus*), Jamaica.

The noble herb here represented is a common annual "weed" in tropical countries.

139. **Selection of cultivated Flowers,** painted in Jamaica. In the vase, associated with the crimson flowers of one of the Coral trees (*Erythrina* sp.), is a panicle of the sweet-scented lilac and white flowers of *Melia Azedarach*, L. This handsome tree, having elegant, much divided (bipinnate) leaves, is a native of the warm parts of Asia; and it is also a favourite tree of cultivation in other warm countries, including the south of Europe. It bears a variety of names in different countries, such as Pride of India, Holy Tree, Bead Tree (in allusion to the seeds being strung for chaplets), Persian Lilac and Hill Margosa. A valuable oil is extracted from the seeds.

The other flowers are (beginning in front on the left) a crimson *Hibiscus*, behind this a lilac *Lantana*, and the pretty crimson and orange *Asclepias curassavica*, L., now common in nearly all warm countries, with rosy and white varieties of the Oleander (*Nerium Oleander*, Lour.) on the right.

140. **View from the Artist's House** in Jamaica, with Double Rainbow, and Rose Apple and Bananas in the foreground.

141. **Foliage and Flowers** of the Cinnamon Tree (*Cinnamomum zeylanicum*, Bl.), whose fragrant aromatic bark is the cinnamon of commerce. This tree is a native of Ceylon, but it is cultivated and has become wild in Jamaica. Several other species of the genus produce aromatic barks. See 341.

142. **Foliage and Flowers** of the Amatia, Loquat, or Japanese Medlar (*Eriobotrya japonica*, Lindl.), Brazil. This tree is a native of China and Japan, and is closely related to our Medlar, bearing a similar edible fruit (see 169). It is almost hardy in the south of England, though it rarely ripens its fruit. The birds are *Lampornis violicauda.*

143. **An Old Cotton Tree** (*Eriodendron anfractuosum*, DC.) at the Ford, Morant's Bay, Jamaica. Consult the description of 192.

144. **Bamboos, Climbers, Cocoa Nut Trees,** and other vegetation in the Bath Valley, Jamaica.

145. **Tree Fern and "Whish-whish"** (*Ipomæa*, sp.) in the Punchbowl Valley, Jamaica.

146. **The Valley behind the Artist's House** at Gordontown, Jamaica, with *Datura arborea*, L., in the foreground.

147. **Distant View of Newcastle,** Jamaica, with Native Huts, Date Palms, &c., and a Mango in flower in front, on the left.

148. **Group of Epiphytal Orchids and Bromeliads** (*Tillandsia, Oncidium*, &c.), Brazil.

149. **A Piece of Sugar Cane.** Consult the description of 26.

150. **Pancratium caribæum,** L., and a Passion Flower, Jamaica.

151. **Foliage and Fruit of the Akee** (*Blighia sapida*, Kœn.), Jamaica. This tree is a native of Guinea and other parts of tropical Africa, and was conveyed to the West Indies in 1793 by Captain Bligh, of H.M.S. Bounty, in whose honour the botanical name of the genus was given. The same navigator introduced the Bread Fruit into the West Indies. See description of, 347.

152. **View of the Bay of Rio** and the Sugar-loaf Mountain, Brazil.

153. **Billbergia zebrina,** Lindl., Brazil. This most gorgeous epiphyte is a member of the *Bromeliaceæ*, a natural order that includes the Pine Apple, and that was originally restricted to America. Now several species, among them the Pine Apple, are naturalised in tropical Asia and elsewhere. Many members of this family are called Air Plants, because they merely cling to trees and rocks, and have no very evident source of nutrition except the air, though they doubtless absorb organic and inorganic matter that collects on the surfaces to which they attach themselves.

154. **Tree Frogs** (*Hyla*, sp.) found amongst dead eaves, Brazil.

155. **Organ Peaks,** seen over the morning mists from Theresopolis, Brazil.

156. **A Ground Orchid** (*Epistephium sclerophyllum*, Lindl.), a Cactus (*Epiphyllum*, sp.), and a Large Snail (*Bulimus* sp. ?), Brazil. The Cactus is used by brewers as a substitute for hops.

157. **Brazilian Wild Flowers.** In front on the bottom is the orange and red inflorescence of a species of *Aphelandra ;* above it the lilac flowers of *Lisianthus*

inflatus, Mart.? further to the right *Canna*, and above it the handsome *Lisianthus pulcherrimus*, Mart. The large white flowers appear to be those of *Escobedia scabra*, Ruiz et Pav., a plant ranging from Brazil to Mexico; and above it is a small *Melastomacea*, with *Dyckia remotiflora* on the left, and a *Marica* below.

158. **Bermuda Mount**, Jamaica, with a Calabash Tree (*Crescentia Cujete*, L.) covered with Epiphytes in the foreground.

159. **Study of Banana and Trumpet Tree** (*Cecropia peltata*, L.) Jamaica. Consult the descriptions of 40 and 134.

160. **The Garden of King's House**, Spanish Town, Jamaica, with a tree of *Spathodea campanulata*, Beauv., &c. An inflorescence of the Spathodea, which is a native of west tropical Africa, is represented natural size in 179.

161. **Cultivated Flowers**, painted in Jamaica. Below on the left is a white-flowered *Gardenia*, and the snowy scarlet *Passiflora quadriglandulosa*, Rodsch. (syn. *Tacsonia sanguinea*, DC.); above *Datura sanguinea*, L., and *Broughtonia sanguinea*, R.Br., with a cluster of *Tabernæmontana*, sp. (?) in the centre; a leaf of a *Caladium*, a spike of *Lagerstrœmia Flos-reginæ* and flowers and fruit of a Passion Flower (*Passiflora alata*?) on the right.

162. **Valley of Bamboos**, near Bath, Jamaica. The arboreous grasses called Bamboos form a very prominent feature in the vegetation of most tropical countries, and more especially of tropical Asia, where the true Bamboos (i.e. *Bambusa*, spp.) are at home. Their useful applications are almost endless, in consequence of which they are, in common with the Banana and Cocoa Nut, extensively cultivated, or protected—for

they need very little attention. Further particulars may be found in the description of 324.

163. **View over Port Royal,** Jamaica, with Bamboos in the foreground.

164. **Bananas and Rocks at Paquita,** Brazil.

165. **Flowers of a Coral Tree** (*Erythrina*, sp.) and of *Brunfelsia Hopeana*, Benth. (syn. *Franciscea Hopeana*, Hook.), Brazil.

166. **The Bilimbi or Blimbing** (*Averrhoa Bilimbi*, L.), Jamaica. A small tree native of the Malayan Islands, cultivated for its fruit, which makes good tarts; a cooling drink is also prepared from it. Observe the flowers and fruit borne on the trunk. The Carambola, another species of the genus, is represented in 358.

167. **Foliage, Flowers, and Fruit of the Coffee** (*Coffea arabica*, L.), Jamaica. This is a small tree or shrub, native of the mountains of eastern tropical Africa, now cultivated and naturalised in the lower mountainous regions of many other tropical countries. In consequence of the common coffee being very much injured under cultivation by various animal and vegetable parasites, it has been largely replaced during the last few years by another species (*Coffea liberica*), which is a more robust plant, and therefore, it is hoped, better able to resist the attacks of parasitic organisms.

168. **The Calaveras Grove of the Big Tree, Mammoth Tree, or Wellingtonia** (*Sequoia gigantea*, Decaisne, syn. *Wellingtonia gigantea*, Lindl.), in the evening. The Big Tree is here associated with the Sugar Pine (*Pinus Lambertiana*, Dougl.), which has cones a foot to eighteen inches long, and when they are ripe they weigh

down the ends of the branches, making the tree look like a Chinese pagoda. The Big Tree, or Mammoth Tree of California, occurs in groups with other trees, along a line of country on the western slope of the Sierra Nevada, some 240 miles in length. This is the largest and tallest tree in America, and is only exceeded in height by some of the Gum Trees of Australia. The height of the tallest one yet discovered, which is in the Calaveras Grove, is 325 feet. One of the finest and largest trees of this grove was cut down, and its age ascertained to be about 1,300 years; yet it is possible that others considerably exceed this age, as, for instance, the "Grisly Giant," of the Mariposa Grove (228). For some time only the Calaveras Grove was known, and this grove, it is recorded, was first discovered in 1852 by an American hunter; and it was rediscovered in 1853 by W. Lobb. This tree was first cultivated in this country by Messrs. Veitch in 1854. See 185, 227, 228, &c. The Pine is also a very tall tree, growing from 150 to 300 feet high.

Panel 72 is a specimen of the wood of the Big Tree, and 73 of the Sugar Pine.

169. **Foliage and Fruit of the Loquat, or Japanese Medlar** (*Eriobotrya japonica*, Lindl.), Brazil. A native of Japan, cultivated in Brazil and elsewhere. The flowers are represented in 142.

170. **Inflorescence of the Cocoa Nut Palm** (*Cocos nucifera*, L.), and ripe Nuts at the bottom, on the right. The inflorescence is a branched spadix bearing innumerable flowers, only a few of which are female and fertile, the rest containing only stamens. When young the spadix is enclosed in a large spathe, which is partly seen above the flowers in the picture. As commonly seen in this country, the nut is divested of its dense fibrous outer coat, and consists of a hard bony shell (endocarp)

containing one seed, which is noteworthy for its size. The seed itself consists of a very small embryo near one of the three holes at one end of the nut, a layer of a solid substance (albumen) and a quantity of liquid (also albumen) in a central cavity, which in germination serve to nourish the young plant until it has formed roots and is able to draw its food from the soil. See the description of 243 and panels 88 and 124 of the wainscot below.

171. **Date Palm and Negro Hut,** near Craigton, Jamaica, with *Alpinia nutans*, Roscoe, in the foreground. The showy Alpinia is represented natural size in 137.

172. **Flowers of a Shrubby** *Convolvulacea*. Jamaica.

173. **Group of small Palms** (*Bactris*, sp. ?), Rio Janeiro, Brazil.

174. **Foliage and Fruit** of Arnatto (*Bixa Orellana*, L.) and Foliage and Flowers of Logwood (*Hæmatoxylum campechianum*, L.), Jamaica. These are both dye plants, indigenous in tropical America. Arnatto is an orange-yellow used for dyeing silks and colouring cheese. It is obtained from the pulp in which the seeds are embedded. Logwood is largely used in combination with other things, by calico printers, &c.; and it is one of the ingredients that give the glossy black to silk hats.

175. **View over Kingston and Port Royal** from Craigton, Jamaica, with Star Apple Trees (*Chrysophyllum Cainito*, L.) in the foreground. The fruit of this tree is represented in 121.

176. **Foliage, Flowers, and Fruit** of a variety of Guava (*Psidium*, sp.)

177. **Study of Gulf Weed** (*Sargassum vulgare*, Ag.) a seaweed that accumulates in enormous quantities in the warm Gulf Stream of the Atlantic.

178. **View over Ochos Rios**, Jamaica. The beginning of a river flowing out of the limestone caves, beneath masses of bananas and *Caladium esculentum*, and finding its way down through the terraces of Allspice and Orange trees to the bay, in which the coral reefs give a lilac tint to the clear water. Cabbage and Cocoa Nut Palms in the foreground.

179. **Inflorescence of** *Spathodea campanulata*, Beauv., a West African *Bignoniacea*, with flowers of *Cordia* spp., a *Rubiacea*, and of the blue *Clitoria ternatea*, L.

180. **One of the Sources of the Roaring River**, with trees of *Grias cauliflora*, L., embedded in stalagmites. Jamaica.

181. **View of the Sandy River** at Spanish Town, Jamaica, and people bathing.

182. **Foliage, Flowers, and Fruit** of Lignum Vitæ (*Guaiacum officinale*, L.), Jamaica. Lignum Vitæ is an exceedingly hard wood, used for making pulley blocks, rulers, pestles, &c.; and the resin called gum guaiacum is an exudation from the stem.

183. **Study of** *Euphorbia splendens*, Boj., aud *Thunbergia alata*, Boj., two Madagascar plants commonly cultivated in this and other countries.

184. **Flowers of Jasmine Mango or Frangipani** (*Plumeria*, sp.; *P. rubra*, L.?) from the Island of Paquita. Brazil. The flowers come before the leaves, and when the latter appear a large caterpillar also often comes and eats them all up.

185. **Looking into the Calaveras Grove of Big Trees**, California. See the description of 168.

186. **View from Spring Gardens,** Buff's Bay, Jamaica, with Cocoa Nut Palms, Bread Fruit Trees, and Trumpet Tree in the foreground.

187. **Under the Redwood Trees** at Goerneville, California. Consult the description of 218.

188. **Study of Cocoa Nut Palm.** See 170 and 243.

189. **Study of Screw Pine.** See 260.

190. **Great Cotton Tree** (*Eriodendron anfractuosum*, DC.), Jamaica. Before the discovery of the Californian Big Tree and the larger Gum Trees of Australia, this was one of the tallest trees known. The natives hold it in superstitious veneration, and will neither cut it down when alive nor remove it when dead. Its wood is soft and spongy, and it sheds its leaves in winter, yet it is so covered with parasites and epiphytes that the leaves are hardly missed. The silky cotton enveloping the seeds is used to stuff beds and pillows, and Humming Birds line their nests with it. There is an Asiatic species, flowers and fruit of which are represented in 454.

191. **View of Clifton Mount** and the Blue Mountain, Jamaica, with Coffee Plantation in the foreground.

192. **Snakewood Tree** (*Cecropia peltata*, L.?) and Bamboos, on Spanish River, Jamaica.

193. **View in the Fernwalk,** Jamaica. This is at an elevation of 5,000 feet above the sea, and it is nearly always bathed in a mist.

194. **Group of Flowers, Wild and Cultivated,** in Jamaica. The large white flower (*Portlandia grandiflora*, L.) in the centre and the lovely blue Convolvulacea (*Ipomæa mutabilis*, Ker.?) are two of the most beautiful of all climbing plants. Above the latter is *Bougain-*

villea spectabilis, Willd.) the blue *Heliotropium* (*H. indicum,* L. var. ?), and the scarlet *Hippeastrum Reginæ,* Herb.; and on the right, beginning at the top, the singular *Epidendrum cochleatum,* L., *Eugenia Jambos,* L., *Hibiscus Rosa-sinensis,* L., and *Meyenia* ?

195. **View on the Flamsted Road,** Jamaica, with Mango tree in flower, Cabbage Palm, Bananas, and Bamboos.

196. **Study of the "Plant of Life"** (*Bryophyllum calycinum,* Salisb.), with *Ipomœa purpurea,* L., and *Thunbergia alata,* Boj., plants cultivated in Jamaica. When placed on damp earth the leaves of the first produce in the notches buds that grow into independent plants; and in a warm moist climate it will do the same if merely pinned to a wall.

197. **Study of Cocoa Nut Palm,** with Mango in flower and Sugar Plantations beyond. See descriptions of 243, 327, and 510.

198. **"Castor and Pollux"** in the Calaveras Grove of Big Trees, California.

199. **Vegetation of the Desert** of Arizona. There are various Cacti, including the Suarrow or Suguaro of the Mexicans (*Cereus giganteus,* Englm.), the largest and most striking member of tho family, sometimes as much as sixty feet high, and two feet in diameter. The plant with whiplike branches is *Fouquiera splendens,* Engelm. represented of the natural size in front; and the trailer is a kind of Gourd, most likely *Cucurbita digitata,* A. Gr.

200. **Foliage, Flowers, and Fruit** of the Citron (*Citrus medica,* Risso), and Butterfly; painted in Brazil.

201. **View of both Falls** of Niagara.

202. **Old Cypress or Juniper Tree,** Nevada Mountains, California.

203. **The Mariposa Grove of Big Trees,** California. Consult the description of 168.

204. **Foliage and Flowers of the Californian Dogwood** (*Cornus Nuttallii*, Audubon), and Humming Birds (*Selasphorus rufus*), California. At first sight the inflorescence of the Dogwood seems so like the flowers of a Clematis that one might take it to be a flower. In reality it consists of a number of small flowers closely packed together, encircled by a number of white leaves (bracts).

205. **Autumn Tints in the White Mountains,** New Hampshire, United States. The leaf-shedding trees of North America generally assume more brilliant colours in autumn than the trees of Europe. This is not altogether due to climate, for the North American trees retain this peculiarity when transplanted to this country.

206. **Wild Flowers from the Neighbourhood of New York,** U.S. America. The plant in front resembling our native Cuckoo Pint, or Lords-and-Ladies, is the Indian Turnip of the Americans (*Arisæma triphylla*, Torr.), associated with a species of Lady's Slipper (*Cypripedium parviflorum*, Salisb.), a Solomon's Seal (*Polygonatum biflorum*, Ell.), False Spikenard (*Smilacina racemosa*, Desf.), and a purple Geranium (*G. maculatum*, L.). On both sides in front are flower-bearing branchlets of the Black Huckleberry (*Gaylussacia resinosa*, Torr. & Gr.).

207. **The American Fall from Pearl Island,** Niagara, U.S.

208. **Wild Flowers from the Neighbourhood of New York.** In front, on the left, is the singular Cancer

Root, or Naked Broomrape (*Aphyllon uniflorum*, Torr. & Gr.), a root-parasite allied to our Broomrapes, remarkable in having only one flower on each stem; behind is the scarlet and yellow Columbine (*Aquilegia canadensis*, L.), with the purple Lady's Slipper (*Cypripedium acaule*, L.) in the centre; and the Pinxter Flower (*Azalea nudiflora*, L.), and the Stagger Bush (*Andromeda Mariana*, L.), on the right.

209. **A View of Lake Tahoe and Nevada Mountains,** California, with Pine Trees (*Pinus ponderosa*, Dougl.) in the foreground.

210. **Rainbow over the Bridal Veil Fall,** Yosemite, California, with Cypress, Douglas Fir, Alder and Dogwood Trees in the foreground.

211. **On the Rocks,** near West Manchester, Massachusetts, U.S. America.

212. **A Fallen Giant,** Calaveras Grove, California.

213. **North American Trees and Shrubs.** The Tulip Tree (*Liriodendron tulipifera*, L.), the False Acacia or Locust Tree (*Robinia Pseudacacia*, L.), and the Calico Bush or Mountain Laurel (*Kalmia latifolia*, L.), with varieties of *Azalea* and *Rhododendron.*

214. **View of Mrs. Skinner's House** at West Manchester, Massachusetts, U.S., with Indian corn in the foreground.

215. **View of Lake Donner,** on the Sierra Nevada, with the Great Pacific Railway on the right.

216. **Lake Tahoe,** California, with foreground of Yellow Pine and Cypress hung with yellow Lichen.

217. **Group of Californian Wild Flowers.** Beginning in front on the left, is a yellow Columbine (*Aquilegia chrysantha*, A. Gr.), and behind it the dark blue Spiderwort (*Tradescantia virginica*, L.), which is probably not

really wild in California; above, in the pot, the large showy Mariposa Lily (*Calochortus venustus*, Benth.), with the pink-flowered Centaury (*Erythræa venusta*, A. Gr.), the blue-flowered "Chia" (*Salvia Columbariæ*, Benth.), and the buff Monkey Flower (*Mimulus glutinosus*, Wendl.); then come the purple and white whorled flowers of *Collinsia bicolor*, Benth., the large pale blue *Phacelia Whitlavia*, A. Gr., the smaller darker blue flowers of *P. grandiflora*, A. Gr., and the narrow spike of white flowers is *Antirrhinum Coulterianum*, Benth.; these are succeeded by the azure *Pentstemon azureus*, Benth., the more slender crimson *P. centranthifolius*, Benth.; and the plumelike scarlet *Castilleia affinis*, Hook. and Arn.; nestling down among the other flowers are the purple and white clusters of *Orthocarpus purpurascens*, Benth., with the large yellow *Gerardia* (?), and the yellow starlike flower-heads of *Layia platyglossa*, A. Gr., in front; and in front of the pot are the dull blue *Triteleia laxa*, Benth., the dark blue and white *Delphinium variegatum*, Torr. and Gr., finishing with the showy white Wake Robin (*Trillium grandiflorum*, Salisb.).

218. **View in a Redwood Forest**, California. The Redwood (*Sequoia sempervirens*, Endl.) is the most valuable tree of the Californian forests, and is almost equal in size to the Big Tree or Mammoth Tree, many examples being forty feet in circumference at the base, and from 200 to 300 feet high. Forests of this tree produce even a more striking effect on one than those of the Mammoth Tree itself. The Redwood inhabits the coast ranges from Oregon to San Luis Obispo, and was first discovered by Menzies, in Vancouver's expedition, about the year 1794, and rediscovered by Douglas in 1883. Panels 68 and 70 of the wainscot are specimens of the wood.

219. **Dwelling of an Old Trapper** in the Hollow trunk of a Big Tree, Calaveras Grove, California.

220. **Another View of Lake Tahoe and Nevada Mountains,** California. See 209 and 216.

221. **An old Cedar** (*Juniperus virginiana,* L.) on the rocks near West Manchester, Massachusetts, U.S.

222. **Some Wild Flowers** of California. In front is the curious Thistle-leaved Sage (*Salvia carduacea,* Benth.), with a species of *Cyclobothra* on the right; a scarlet Catchfly (*Silene californica,* Dur.), and a species of *Phlox* above; and the American Cowslip or Shooting Star (*Dodecatheon Meadia,* L.) on the left. The last is very widely dispersed in North America.

223. **The Yosemite Waterfall,** California, with Balsam Poplars (*Populus trichocarpa,* Torr. & Gr.) in the foreground. The Upper Yosemite Fall is stated to be about 1,550 feet high; and below it the stream descends, by a series of cascades and falls, about a thousand feet more to the bed of the valley, making altogether a fall of 2,550 feet.

224. **Californian Flowers.** The crimson "Snow Plant" (*Sarcodes sanguinea,* Torr.) grows in decaying vegetable matter in the Big Tree groves and other coniferous woods. Above, on the right, is the elegant little shrubby *Chamæbatia foliolosa,* Benth., and below, on the left, the slender flower-stem of *Lithophragma heterophylla,* Torr. & Gr., a member of the Saxifrage family, with tufts of the widely spread *Claytonia perfoliata,* Don, on the right and at the top. Behind the *Lithophragma* are two young seedlings of the Big Tree, which have not yet thrown off the shell of the seed.

225. **Autumn Tints**, near Niagara, United States.

226. **North American Carnivorous Plants.** Painted from plants grown in this garden. Behind, on the left, is *Darlingtonia californica*, Torr., with *Sarracenia purpurea* L., in front of it; *S. flava*, L., on the right, and Venus's Flytrap (*Dionœa muscipula*, Ellis) in front. The flower of *S. flava* was faded when it was painted. Among the many plants provided with the means for entrapping insects, the North American *Sarraceniaceæ*, or Side-saddle Flowers, are not the least interesting, being curious alike in their leaves and flowers. The genus *Sarracenia* numbers several species, all of which inhabit the Eastern States, ranging from New England to Florida, whilst the solitary species of *Darlingtonia* is confined to the mountains of North California, from the Truckee Pass, through which the great Pacific Railroad is carried, northward to Oregon. *Heliamphora nutans*, a native of Guiana in South America, is the only other member of the order known. *Dionœa* belongs to the same natural order as our Sundews. Only one species is known, and that is restricted to Bogs and Pine barrens in North and South Carolina.

227. **Ghost of the Big Tree** that was barked up to a height of 116 feet, and the bark exhibited at the Crystal Palace, Sydenham, until destroyed by fire a few years ago. Calaveras Grove, California.

228. **The "Great Grisly" Big Tree of the Mariposa Grove.** It is ninety-three feet seven inches in girth at the base, and about sixty feet at eleven feet from the ground; and its first branch is six feet in diameter.

The flowers around the doorway are: Coffee (*Coffea arabica*, L.) from Eastern Africa, in the centre, with *Gloriosa superba*, L., from India, and *Ipomœa jalapa*, Pursh, from Mexico, on the right; and *Lapageria rosea*, Ruiz and Pav., from Chili, and *Rhodochiton volubile*, Zucc., from Mexico, on the left.

On the panels of the door are a hybrid *Clematis* of the Japanese type, and, to the right, *Clerodendron Thomsonæ*, Balf., a native of western tropical Africa.

229. **Indian Almond** (*Terminalia Catappa*, L.), with a tree of the same in the distance on the left. This tree is commonly planted in India for shade; and it is remarkable in its mode of branching, the branches being given off from the trunk in tiers or whorls like the shelves of a dumb waiter. In autumn the foliage changes to a brilliant crimson. The seeds resemble almonds and are edible, but they have not the flavour of the almond.

230. **Wild Flowers of Mussooree**, India. Although wild, the Cactus (*Echinopsis oxygona*, Zucc.) and the little yellow Calceolaria are not indigenous in India. The Primulas are indigenous.

231 **The South Indian Rhododendron** (*Rhododendron urboreum*, var. *nilagiricum*), Nilgiri Mountains, South India. This is the only species of Rhododendron found in the Peninsula of India. Some botanists have regarded it as distinct from the Himalayan *R. arboreum*; but the differences are very trifling. See 257.

232. **Clump of Abyssinian Bamboo** (*Oxytenanthera abyssinica*, Munro, syn. *Bambusa abyssinica*, Rich.), in the Botanic Gardens, Peradeniya, Ceylon, where it was planted thirty years ago. It is now probably sixty feet high. This is the only species of Bamboo known to be indigenous in the whole of Africa.

233. **Foliage, Flowers, and Fruit** of the Cashew (*Anacardium occidentale*, L.), with a Tree of the same and an Ants' Nest in the background, Tanjore, India. The Cashew is common in most hot countries now, yet

it is believed to have been originally introduced from the West Indies. Its acid astringent fruit is peculiar in its structure. the nut or seed-vessel being seated on a fleshy stalk. The shell of the nut contains a very acrid, caustic oil. The kernel is the edible part.

234. **Panch Choola,** from Binsur, with Oak Trees and Grey Apes in the foreground.

235. **Foliage, Flowers, and Fruit** of *Bauhinia variegata,* L., a common Indian forest tree. The genus *Bauhinia* is numerous in species, widely diffused in warm countries. It belongs to the *Leguminosæ* and is allied to *Cassia* (302) and *Poinciana* (342). Observe the twin leaflets, a character which suggested the happy idea of dedicating the genus to the brothers John and Caspar Bauhin, botanists of the sixteenth century.

236. **Roadside Scene** under the Cocoa Nut Trees at Galle, Ceylon. See description of 170 and 243.

237. **Foliage and Fruit of the Wampee** (*Cookia punctata,* Retz.), and Scarlet American Passion Flower (*Passiflora quadriglandulosa,* Rodsch.); painted in Ceylon. The Wampee fruit belongs to the same natural order as the orange, and is esteemed in China and the Indian Archipelago.

238. **Study of Cereals** cultivated at Kumaon, India, in an old brass chatty, with a Cob of Maize or Indian Corn (*Zea Mays,* L.) lying in front. The purple brown and the green spikes hanging on the left are varieties of Millet (*Setaria,* sp.), behind them the Natchee (*Eleusine coracana,* Gærtn.), and on the right a spike of *Oplismenus,* sp.

239. **Flowers and Young Fruit of the Chinese Banana** (*Musa chinensis,* Sweet). This differs little from the

common Banana except in stature. See the description of 8.

240. **View of the Himalaya Mountains** from Mussooree, with Roses and Rhododendrons in the foreground.

241. **View from the Top of the Waterfall** at Kamboddy, Ceylon, with *Datura arborea*, Bananas and Ironwood tree in the foreground, and Rice and Tea Plantations in the distance.

242. **The Taj Mahal** at Agra, built by the Shah Jehan in memory of the beautiful Noor Mahal. Commenced 1630, finished 1647. In the foreground *Poinsettia*, *Bougainvillea*, Cypresses, and a species of rattan Palm (*Calamus*) attached to the tree on the right.

243. **Cocoa Nut Palms** (*Cocos nucifera*, L.) on the coast near Galle, Ceylon. Although the Cocoa Nut Palm will thrive at a considerable distance inland, it is essentially a maritime tree, growing most luxuriantly on sandy and rocky shores. And it exists, cultivated or wild, in such situations, on the coasts of tropical Asia especially, in such vast numbers as to constitute the most striking feature in the scenery. It is without exception the most extensively cultivated tree of any clime, being now seen in almost every tropical country, insular and continental; and its importance to countless numbers of the human race is almost beyond conception. Even in this country we are familiar with some of the products in the form of cocoa-nut matting, stearine candles, and the nuts themselves; yet these, valuable as they are, give but a very imperfect idea of the usefulness of this Palm in the countries where it grows. Marco Polo, one of the earliest European writers who described the Cocoa Nut, says, "The Indian nuts grow

here (in the Indian Archipelago) of the size of a man's head, containing an edible substance that is sweet and pleasant to the taste, and white as milk. The cavity of this pulp is filled with a liquor clear as water, cool and better flavoured and more delicate than wine or any other kind of drink whatever." Another writer says, "The Cocoa Nut Palm is alone sufficient to build, rig, and freight a ship with bread, wine, water, oil, vinegar, sugar, and other commodities."

> The Indian Nut alone
> Is clothing, meat and trencher, drink and can,
> Boat, cable, sail, mast, needle, all in one.—*G. Herbert.*

The cultivated Cocoa Nut Palm begins to bear from the fifth to the eighth year, according to soil and situation, and continues bearing from seventy to eighty years. It grows from forty to eighty or even one hundred feet high, bearing annually from thirty to sixty nuts, or sometimes, when in its greatest vigour, as many as a hundred. The Cocoa Nut Palm is represented in many of the landscapes in this collection, notably in 197, 236, 265 and 441; and 170 is a picture of its inflorescence and nuts, which are briefly described under that number. The wood is represented in panels 88 and 124 of the wainscot.

244. **View from Rungaroon,** near Darjeeling, India, with Old Tree covered with Epiphytes in foreground.

245. **Foliage, Flowers, and Fruit** of a Night-flowering African Tree (*Kigelia pinnata,* DC.), with a tree of the same behind; painted in India. This tree inhabits both the east and west sides of tropical Africa, and presents most singular appearance when in fruit, the pods being sometimes two feet or more in length, hanging from long slender stalks. The flowers open only at night.

246. **Wild Pine Apple** (*Ananas sativus*, Mill. var.) in Flower and Fruit, Borneo. The Pine Apple is believed to be really indigenous only in Brazil, whence it has spread to other countries, in some of which it has become naturalised and wild. It first became known to Europeans in Peru some three centuries ago; and it was successfully cultivated in this country at the beginning of the eighteenth century if not earlier. Another plant of the same natural order is the gorgeous *Billbergia zebrina*, Lindl. (153). See description of that picture.

247. **Foliage and Flowers of** an Indian tree (*Tecoma undulata*, Don, syn. *Bignonia undulata*, Roxb.). A most beautiful tree when its hanging branches are laden with flowers.

248. **Foliage and Flowers of** *Rhododendron argenteum*, Hook. f., a native of the Sikkim Himalaya, India, where it forms a tree thirty feet high or more, at elevations of 8,000 to 9,500 feet. It is in this region that the genus Rhododendron reaches its greatest development, both in number and diversity of species. Sir J. D. Hooker collected thirty-two species in one valley. See 231, 257, and 279.

249. **Valley of Ferns** near Rungaroon, India.

250. **View of the Cathedral Rocks** from Mattaran, India. Monkeys in the foreground.

251. **Gardening at Nainee Tal**, India. On the other side of the lake, below the Oak Trees, the Willows are seen that shaded the Temple of the Goddess, now covered by a landslip.

252. **Deodars** (*Cedrus Deodara*, Loud.) and the Choor Mountain, from Nahl Dehra, India. The Deo-

dar or Indian Cedar is one of the noblest trees of the mountains of North India. See remarks under 328.

253. **Wild Flowers of Simla**, India. Ladies' Slipper Orchid (*Cypripedium*), Violet, and *Ophiopogon spicatus.*

254. **Some of Mrs. Cameron's Models**, with Cocoa Nut and Teak Trees, Kalutara, Ceylon.

255. **Tomb of Ali ud Deen**, now used as one of the entrances to the Kutub courtyard, with Neem Tree (*Azadirachta indica*, Juss.) over it, Delhi, India.

256. **Ceylon Pitcher Plant** (*Nepenthes destillatoria*, L.) and Butterflies (*Papilio Crino*).

257. **Foliage and Flowers of** *Rhododendron arboreum*, Sm., and *R. Griffithianum*, Wight. Sikkim, Himalaya, India. The latter, the one having white flowers, is better known in gardens under the more recent name of *R. Aucklandii*, Hook. f. In its native country it sometimes grows forty feet high, and has a trunk as thick as a man's body. The former is the commonest species in the mountains of North India, and it recurs in the Nilgiri Mountains in the Peninsula. See 231.

258. **Foliage and Flowers** of a tropical American Tree (*Brownea coccinea*, Farq.), painted in Ceylon.

259. **The Elephant Creeper** (*Argyreia speciosa*, Sweet) of India. Leaves used by the natives in the preparation of poultices, and also in cutaneous diseases.

260. **Male Inflorescence** of a Screw Pine (*Pandanus odoratissimus*, L. f.) with Trees of the same behind and Buffaloes wallowing in the mud of the swollen river. Screw Pines are so called in allusion to the spiral arrangement of their long prickly leaves, which re-

semble those of a gigantic pine-apple. There are perhaps thirty or more distinct species, chiefly inhabiting the coasts of the Mascarene Islands and the Indian Archipelago. They often cover large tracts of tidal swamps; and their stilted roots which are always increasing in number, enable them to resist the rush of the water. The male and female flowers are borne on separate trees, each inflorescence containing a large number of flowers. A ripe fruit, the matured female inflorescence of this species, is depicted in 514. The male flowers are dried and used as a scent by Indian ladies. See also 80 and 393.

261. **Foliage and Flowers** of the Red Cotton Tree (*Bombax malabaricum* DC.), and a pair of Long-tailed Flycatchers (*Muscipeta paradisi*), Ceylon. This is a very large tree, common in the forests of South India and Burma. Like the White Cotton Tree (454) the seeds of this tree are enveloped in silky cotton which is used for stuffing pillows and cushions. These so-called Cotton Trees belong to the same Natural Order as the true Cotton Plant (121), *Eriodendron*, &c., but the staple of the cotton of their seeds is too short and brittle for manufacturing purposes.

262. **Bombay Pedlars** in Mrs. Cameron's Verandah, Kalutara, Ceylon.

263. **Wild Flowers** of Mt. Tonglo, Sikkim, Himalaya, India. The trailer with blue flowers is *Crawfurdia speciosa*, Wall., a Gentianaceous plant, and its associate a species of *Impatiens*.

264. **Young Shoots** of the Iron Wood Tree (*Mesua ferrea*, L.) from the Botanic Garden, Peradeniya, Ceylon. See also 285. The insect is a species of *Orthopteron*.

265. **Cocoa Nut Palms** on the River Bank near Galle, Ceylon. For some information respecting this Palm the reader is referred to the descriptions of 170 and 243.

266. **Blue Poppy** (*Meconopsis Wallichii*, Hook.) growing on Mt. Tonglo, Sikkim-Himalaya, at 10,000 feet above the level of the sea, India. This ornamental plant has several times been introduced and cultivated in this country, where, however, it does not develope its full beauty. See 275.

267. **Wild Flowers** of Kumaon, Himalaya, India. On the left a robust species of *Habenaria*, with the purple *Strobilanthes Wallichii*, Nees, above; the large lilac flower is a species of *Roscoea*, and the plant above, having small white flowers, an *Argostemma*.

268. **Foliage and Fruit** of the Cherimoyer (*Anona Cherimolia*, Mill.), a delicious fruit of Peru. Several other species of the same yield excellent fruits, as *A. reticulata*, L. See 352.

269. **The Great Tank of the Island Temple at Madura**, India, with Palmyra Palms (*Borassus flabelliformis*, L.) For some particulars of the Palmyra consult the description of 524.

270. **Foliage and Flowers** of the Suriya or Portia tree (*Thespesia populnea*, Corr.) with trees of the same behind; the Pagodas of Madura seen in the distance, beyond the flooded ground. India. The Portia is a fast-growing tree, commonly planted for shade in Southern India. When the flowers first open they are yellow, changing to red as they get older.

271. **Foliage, Flowers, and Fruit** of *Lagerstrœmia Flos-reginæ*, Retz, a forest tree of India, with a tree of the same in the distance. This is one of the showiest of Indian forest trees when in blossom. It belongs to the

same natural order as our native Purple Loosestrife (*Lythrum Salicaria*, L.) See 467.

272. **Foliage and Flowers** of *Pterospermum acerifolium*, Willd., a most beautiful forest tree of India with velvet buds and satin leaves. It is a member of the *Sterculiaceæ.*

273. **Iron Pillar of Old Delhi,** India. Though the English by digging have found that its foundations are only twenty inches below the surface, the Hindoos still maintain that its roots are in the centre of the earth. An inscription upon it gives its age to be about the fifth century, though how it was forged of solid iron at that period is a mystery. The height of it is twenty-three feet, with a diameter of twelve to sixteen inches. The Great Arch of the Mosque of Kutub ud Deen is seen in front, with Neem *Azadirachta indica,* Juss.) and Peepul (*Ficus religiosa,* L.) trees on either side.

274. **Avenue of Indian Rubber Trees** (*Ficus elastica,* Roxb.) at Peradeniya, Ceylon. This tree is a native of Assam in Northern India, and is familiar to most people in this country in a small state; the evergreen with large glossy leaves so commonly grown in rooms being the same plant. It is a wonderful example of a plant that can exist in a healthy state under widely different conditions. Compare the massive buttressed trunks of the trees in the picture with the plant growing in a handful of earth, and imagine the latent vital energy in the latter that favourable conditions would bring forth! Many other trees besides the present yield caoutchouc; but the product of this tree, under the name of Indian Rubber, was one of the first kinds employed in the manufactures. In all cases it is obtained in the form of a milky juice from incisions in the trunk.

275. **View of Kinchinjunga** from Tonglo, with Rhododendron Trees and Blue Poppies (*Meconopsis Wallichii*, Hook.) in the foreground. India. Consult 266 and 290.

276. **African Baobab Tree** (*Adansonia digitata*, L.) in the Princess's Garden at Tanjore, India. This tree is remarkable for the gigantic proportions of its relatively short trunk, which sometimes, it is recorded, exceeds 100 feet in girth in its native country, tropical Africa. In consequence of the enormous size of its trunk and some other circumstances, travellers and writers of repute have assigned a very great age—as much as 5,000 years—to some of the larger specimens of this tree in western tropical Africa; but there are good reasons for doubting these estimates, notably the rapid growth of the tree. Further, the wood is soft and spongy and soon decays, leaving the trunks hollow. In these hollow trunks the negroes suspend the dead bodies of those who are refused the honour of burial; and in this position the bodies are preserved without any process of embalming. The useful products of the Baobab are not unimportant. Amongst other things the foliage is used medicinally and as a condiment; a fibre is obtained from the bark that is so strong as to have given rise in Bengal to the saying "as secure as an elephant bound with a Baobab rope;" and the gourd-like fruit, which is called Monkey-bread and Ethiopian Sour Gourd, is also eaten, and is especially valuable for its febrifugal qualities. The botanical affinities of *Adansonia* are with *Bombax* (259), *Durio* (366) and *Eriodendron* (454). A second species, having an equally bulky trunk, occurs in Australia, and the African species, or a closely allied one, also inhabits Madagascar.

277. **Foliage and Flowers** and a Pod of the Amaltas (*Cassia Fistula*, L.), with a tree of the same in the dis-

tance. India. Anglo-Indians call this tree Indian Laburnum. It is a native of India, but it has been introduced into the West Indies and elsewhere, whence its long cylindrical pods are imported into this country. A sugary substance, extracted from the pulp between the seeds, is commonly used as a laxative. The pods of this and a few allied species differ from those of the remainder of the large genus *Cassia* in having transverse partitions, so that each seed has a compartment to itself. Senna leaves of the druggists are the product of various species of *Cassia*. Look at 47, 302, and 520.

278. **Deodar Grove** at Simla, India, with Wild Rose in the foreground. See description of 328.

279. **Tree Rhododendron** (*Rhododendron arboreum*, Sm.) in Flower in Kumaon, India. Compare with 231.

280. **View from Kalutara**, Ceylon, with Casuarina and Cocoa-nut Trees in the foreground.

281. **Loose-skinned Orange** (*Citrus Aurantium*, L. var.) of Colombo, Ceylon.

282. **Nepalese Temple and Peepul Tree** (*Ficus religiosa*, L.) with Blue Pigeons (*Columba livia*), which are sacred to Krishna, bathing in the foreground. Benares, India. See 329.

283. **The Cobra Plant** (*Arisæma curvatum*, Roxb.) under Deodars, at Simla, India.

284. **A Darjeeling Oak** (*Quercus lamellosa*, Smith) festooned with the flowers of *Thunbergia coccinea*, Roxb., syn. *Hexacentris coccinea*, Nees. India.

285. **A View in the Botanic Garden**, Peradeniya, Ceylon. An Iron-wood tree (*Mesua ferrea*, L.) clothed with a young growth of rosy leaves, and a yellow-flowered climber *Bignonia* sp., *B. unguis ?*) with the

Director's house on the left. See 264 for young foliage of the Iron-wood tree natural size.

286. **Wild Flowers of Darjeeling**, India. Hanging above are the crimson flowers of *Æschynanthus bracteata*, Wall., with *Torenia asiatica*, L., on the right; the handsome *Pleione Wallichiana*, Lindl., in the centre, and a delicate species of *Utricularia* below.

287. **A Himalayan Oak** (*Quercus serrata*, Roxb.), and Birds (*Erythrospiza*, sp.). Nainee Tal, India.

288. **Jain Tower and Temple at Chittore**, India, with a Fig tree growing on the top of the former and loosening the stones which were laid a thousand years ago. The tower is eighty feet high, and the Fig tree is sacred and must not be touched.

289. **African Baobab Trees** (*Adansonia digitata*, L.) and a large Tamarind (*Tamarindus indica*, L.); and in the left foreground, under the latter, the god Aiyanar and his two Wives, who take a ride every night, leaving good gifts at the houses of all who give them earthenware horses. The natives of India, it is stated by Drury, have a prejudice against sleeping under the Tamarind tree, and the acid damp from the trees does affect the cloth of tents that are pitched under them for any length of time. For foliage and fruit, natural size, see 522. A short account of the Baobab is given in the description of 276. Panel 108 is Tamarind wood.

290. **Distant View of Kinchinjunga** from Darjeeling, with Tree Ferns and Oaks, festooned with *Thunbergia coccinea*, Roxb., in the foreground. Kinchinjunga is 28,136 feet high, and the highest mountain in the world except the neighbouring Mount Everest, which is 29,000 feet high, and Peak K. 2 in the Karakoram Mountains, which is 28,278 feet. See 275 and 284.

291. **A Magnoliaceous Tree** (*Michelia excelsa*, Wall.), and a Sweet-scented Climber (*Porana grandiflora*, Wall.), Darjeeling, India.

292. **Study of a Deodar** (*Cedrus Deodara*, Loud.) in full cone and clothed with a creeper, probably *Vitis himalayana*, Brandis. Near Simla, India. Look at 300 and 328.

293. **Himalayan Flowers** embedded in Maidenhair Fern. Blue Anemones, a purple Columbine (*Aquilegia*), two species of *Arisœma*—the taller one *A. utile*, Hook., the other *A speciosum*, Mart., &c. At the bottom on the left is *Parochœtus communis*, Hamilt., a plant having clover-like leaves and solitary blue pea-flowers.

294. **Temple in a Dell**, Binsur, Kumaon, India.

295. **View at Peradeniya, Ceylon,** with Bamboos and Jackfruit tree in the foreground. See 360.

296. **Indian Rhododendrons and North American Honeysuckle** (*Lonicera sempervirens*, Ait.). The rhododendrons are *R. blandfordiæflorum*, Hook., yellow and red, and *R. formosum*, Wall.

297. **Road up to Nainee Tal** in spring-time, with a Papilionaceous shrub in flower in the foreground. India.

298. **Trees of** *Picea Smithiana*, Lambert, and Stump covered with a Vine, with Sheep carrying their loads of Tea and Borax into Tibet. On the road near Nagkunda, India.

299. **Flowers of** *Hydrangea altissima*, Wall., and *Thunbergia lutea*, T. And.). Darjeeling, India. The large flowers in the circumference of the inflorescence of the Hydrangea are sterile.

300. **Dibee Dhoora Dee,** a place of pilgrimage, with its well and Deodar trees. Kumaon, India. Consult 328 and its description.

301. **Sunrise among the Pines near Fagoo,** in the Himalaya, India.

302. **Flowers of** ***Cassia nodosa,*** Hamilt., with Tree of the same in the distance, and Bornean Butterflies (*Papilio bathycles*). This species of Cassia is exceptional in the colour of its flowers, nearly all the numerous species having yellow ones. See 47, 277, and 520.

303. **The Island Palace of Jugmunda,** Oodeypore, India, with Cocoanut Palms, and one Palmyra Palm. It was here that the good Rao of Baidbah sheltered, clothed, and fed sixty English women and children during the great mutiny of native soldiers. See 524.

304. **Talipot Palm** (*Corypha umbraculifera,* L.) in flower, near the gate of the Botanic Garden, Peradeniya, Ceylon. This Palm is a native of Ceylon and the Malabar coast, where it grows sixty or seventy or sometimes as much as a hundred feet high, and then flowers and dies. It is a number of years—ten or more—before it begins to form a visible trunk; but when the trunk starts it grows very rapidly. When about thirty years old, it is stated, the enormous terminal inflorescence of hermaphrodite flowers is developed, and the leaves drop off, leaving the fruit to ripen alone. This process takes at least a year, when the tired stem is borne down by the weight of the fruit, and the Talipot's life is over. The leaves of the Talipot are commonly used by all classes for umbrellas, and are often large enough to cover eight persons. This Palm is said to flower gregariously like some of the Bamboos. See 492.

The road-makers in the foreground are working in the native fashion, singing a ballad and letting their rammers fall at the end of each verse only, with a long rest between.

305. **The Great Lily** (*Lilium Wallichianum*, Roem. et. Sch.), of Nainee Tal, in North India, with *Begonia*, and *Chirita urticæfolia*, Buch.-Ham. This fine lily grows seven feet high.

306. **Foliage, Flowers, and Fruit** of a Bignoniaceous tree (*Millingtonia hortensis*, L. f.), a native of the Malay Peninsula, cultivated in South India. Bark used for the same purposes as cork.

307. **Orchids of Tropical Asia.** *Dendrobium superbum*, Rchbf., purple, and *D. Jenkinsii*, Wall. Yellow.

308. **Bauhinia Creeper strangling Tombs,** Saharunpur, India.

309. **View from the Great Cave Temple of Elephanta,** in the Harbour of Bombay, with Fan Palms.

310. **Mango Trees,** Temple and Water-wheel, near Dehra Doon, India.

The thirty paintings in oval mounts (311 to 340) represent a selection of plants often quoted in Sanscrit and other Indian literature. Some of them are used in the sacrifices of the Brahmins, of which the *Soma* is the most important; others supply themes for poets, though it is impossible to understand what they mean without seeing the plants and flowers themselves; others again, are valuable in medicine.

311. **The Kuddum** or **Cadamba** (*Anthocephalus Cadamba*, Miq.), a Rubiaceous tree mentioned by poets. It has a deep, yellow wood recommended for furniture. The yellowish-brown flowers are small and collected in dense balls.

312. **The Oleander** (*Nerium odorum*, Sol.). This is a native of tropical Asia, and very commonly cultivated in gardens for its handsome flowers, which are much used in the decoration of temples. There are varieties having deep red or rose-coloured flowers; and there are others having double flowers.

313. **The Bail** (*Ægle Marmelos*, Corr.), a member of the same natural order as the orange. Its leaves, which are divided into three separate leaflets, are sacred to the Hindoo Trinity; and one of them is doubled up in the turban or sash of a native to propitiate Shiva and ensure safety from accidents. The pulp of the fruit possesses emollient and aromatic properties, and is used in India as a remedy for diarrhœa and dysentery.

314. **The Sacred Lotus** or **Pudma** (*Nelumbium speciosum*, Willd.). This is the most beautiful and graceful of all the Water Lilies, its leaves and flowers usually rising considerably above the surface of the water; and at the same time it is the most interesting on account of its remote historical associations. Four thousand years ago it was the emblem of sanctity in Egypt amongst the priests of a religion long ago extinct; and the plant itself has long been extinct in that country, though very widely spread in the warmer parts of Asia, extending through the islands to Australia. In India and China, Drury states, the flowers are held especially sacred, and the plant is commonly cultivated. For this purpose the seeds are first enclosed in balls of clay and then thrown into the water—the same method was employed by the early Egyptians. See description of 506.

315. **The Chumpa** or **Champak** (*Michelia Champaca*, L.). Commonly cultivated for the fragrance of its flowers, which is so strong, according to Sir W. Jones, that bees seldom, if ever, alight upon them. This tree is

sacred to Vishnu, and is therefore an object of superstitious regard on the part of the Hindoos, who adorn their hair with the flowers—

> The Champak odours fail.—*Shelley.*

Panels 89 and 112 are Champak wood.

316. **The Night Jessamine** (*Nyctanthes Arbor-tristis,* L.). India. These very sweet-smelling flowers open at sunset and fall about sunrise, so that it is unadorned during the day; hence the specific name, *Arbor-tristis,* or sad-tree. The flowers are much used in temples.

317. **Flowers of Sal** (*Shorea robusta,* Roxb.). One of the most valuable of Indian timber trees, 100 to 150 feet high. It also yields a large quantity of resin, which is extensively used as a substitute for pitch in naval yards, and burnt for incense in Hindoo temples. The sweetness of the flowers is sung by Indian poets.

318. **Indian Coral Tree** (*Erythrina indica,* Lam.). The gorgeous flowers of this tree are often mentioned by Indian poets. Since Krishna stole it from the Celestial Garden for his wives, it has been under a curse, and is never used in Hindoo worship. Being armed with prickles it is commonly planted for hedges, and in Malabar it is used as a support for the Betel Pepper. The leaves and bark are used medicinally.

319. **Holy Basil** or **Tulsi** (*Ocimum sanctum,* L.). A most holy herb of the Mint order, grown in pots near every temple and dwelling of devout Hindoos. It is sacred to both Vishnu and Krishna. The root is made into beads, which are worn round the neck and arms; and it is also used medicinally. The Butterfly is *Papilio Sarpedon.*

320. **Foliage of Betel Pepper** (*Piper Betle,* L.) and Areca Nuts (*Areca Catechu,* L.) favourite masticatories

of the Indian races. The nuts are cut into narrow pieces and rolled up with a little lime in the leaves of the Pepper, and chewed. So addicted are the natives to this practice, says Blume, that they would rather forego meat and drink than their Areca nuts, which are exported by ship-loads from the Malayan Islands and Cochin China. For portraits of the Areca Palm see 390 and 405.

321. **Foliage, Flowers, and Seed-Vessels of** *Albizzia Lebbek*, Benth. A timber tree of India.

322. **Gool-achin** (*Plumeria acutifolia*, Poir. ?). A tree of American origin, commonly planted in Indian gardens, and particularly in cemeteries, because it keeps the graves white with its daily fall of fragrant flowers. The branches are very stout, and exude a milky juice when wounded.

323. **White-flowered Thorn Apple** (*Datura alba*, Nees.). This, like several other species of the genus, which are very widely spread in warm and temperate climates, is used both as a medicine and as a poison. The Rajpoot mothers are said to besmear their breasts with the juice of the leaves, in order to destroy their new-born female children.

324. **Flowers of a Bamboo** (*Bambusa arundinacea*, L. ?), with Tufts of the plants behind. Jungle fires are said to be caused by the dead stems rubbing together during high wind and thus kindling a flame. The waving plumes of these gigantic grasses form one of the most pleasing and characteristic features in tropical scenery; and the grasses themselves, although they furnish little in the way of food, rank amongst the most useful members of the vegetable kingdom. Indeed, their uses are innumerable, every part and every condition being applied in a variety of ways. One may be mentioned here for its

novelty. Sections of the full-grown green stems while still containing moisture are capital receptacles for sending cut-flowers to a distance. Bamboos are represented in several of the landscapes in this collection, notably in 85, 134, 371, 375, and 500. They grow from seventy to eighty feet high. Like the lowliest grass the stems of bamboos flower only once and then die. A peculiarity of *B. arundinacea* and some other species is that they flower gregariously, that is to say, all the clumps of the same species in a district flower the same year, and no more flowers of that species are to be had until another generation comes to maturity. The duration of the period seems to vary according to circumstances, but data are wanting to answer this question. It is supposed that the *B. arundinacea* is about thirty years old before it flowers.

325. **Foliage and Fruit of a Species of Fig Tree** (*Ficus glomerata*, Roxb. ?) held sacred by the Hindoos.

326. **The Neem** (*Azadirachta indica*, Juss.). The Neem tree is described by the poets as the type of all that is bitter; and its bark is said to be a fair substitute for Cinchona in cases of fever, &c. It is moreover a very beautiful tree. The leaves are very commonly applied to wounds, either fresh or in poultices. See 273.

327. **Foliage, Flowers and young Fruit** of the Mango (*Mangifera indica*, L.). The Mango is generally regarded as one of the most delicious fruits, though there are many varieties, differing very much in quality. In an unripe state the fruit is much used in tarts, and preserved in sugar or vinegar. Ripe fruit is shown in 510. Along with Sandal-wood, the wood of the Mango is used by the Hindoos in burning their dead. The poets make their Cupid head his arrow with the tiny flowers,

328. **The Deodar**, or Indian Cedar (*Cedrus Deodara*, Loud.). This tree forms large forests in the mountains of northern India, growing to a height of 50 to 100 feet and upwards, and yielding a valuable durable timber. It was introduced into this country in 1822, and has been much planted for ornamental purposes; but it does not appear to thrive so well in the vicinity of London as the cedar of Lebanon. It is often mentioned by the Indian poets. See 292 and 300.

329. **Peepul** or **Bō** (*Ficus religiosa*, L.). A tree, commonly met with near temples and houses, which the natives are very unwilling to cut down at any time. The hindoos hold it sacred in the belief that their god Vishnu was born among its branches.

330. **Foliage and Fruit of the Mahwah** (*Bassia latifolia*, Roxb.). A timber tree, interesting also on account of its being one of the few plants whose flowers are eaten by the human race. They are eaten raw by the poor of India, and they are also largely used in the distillation of a spirit.

331. **A sacred Grass** (*Eragrostis cynosuroides*, R. et S.) used for strewing the floors of temples.

332. **Foliage and Fruit of** *Emblica officinalis*, Gaertn. A Euphorbiaceous tree, whose seeds are used medicinally. The fruit is sometimes preserved in vinegar or sugar.

333. **The Dhak** or Bastard Teak (*Butea frondosa*, Roxb.). One of the most striking of the Indian arboreous *Leguminosæ;* its wood and leaves and flowers, the latter dried and reduced to a fine powder, which is sprinkled, are used in religious ceremonies. The natives are fond of offering the flowers in their temples ; and the females effectively intertwine the blossoms in their hair. It also exudes a ruby-coloured substance employed as catechu.

334. **Sandal-wood of India** (*Santalum album*, L.). A small tree celebrated by the poets on account of the sweet scent of its wood. An oil is extracted which is used to incense temples, and also medicinally.

335. **The Asokâ** (*Saraca indica*, L., syn. *Jonesia Asoca*, Roxb.). An evergreen tree commonly planted in India for the beauty of its foliage and flowers, the latter reminding one at first sight of a *Clerodendron* or an *Ixora* rather than of a member of the *Leguminosæ*. The piece with the flower growing through the honey comb was picked for the artist by the priest of Karlee.

336. **The Soma-lata** (*Sarcostemma aphylla*, Roxb.), a leafless, climbing Asclepiad. A very sacred plant, from which a liquid is distilled that is used in Brahminical sacrifices.

337. **The Akunda** or **Muda** (*Calotropis gigantea*, R. Br.). An asclepiad, various parts of which are used medicinally; and an exceedingly strong fibre is obtained from the branches.

338. **Foliage, Flowers, and Fruit** of *Mimusops Elengi*, L. A tree sacred to Krishna. An odoriferous water is distilled from the flowers; the fruit is edible; and the astringent bark is used medicinally.

339. **Foliage and Fruit of the Banyan** (*Ficus bengalensis*, L.). It is commonly planted for shade, and often covers immense areas, supported by a perfect labyrinth of subsidiary stems and trunks formed from aerial roots that have successively descended from the main branches. There is a record of one being capable of affording shade to 20,000 men. See pictures 487 and 499.

340. **Foliage and Fruit** of *Acacia Catechu*, Willd., and of *Terminalia citrina*, Roxb. The former is a

sacred tree, and yields a very astringent substance by decoction, formerly known as Terra Japonica, and now as one of the kinds of Indian Catechu.

341. **Lane** near Singapore. On the left is an Areca Palm; and the small compact pyramidal tree in front of it is the Nutmeg (*Myristica fragrans*, Houtt., syn. *M. moschata*, Thbg.), flowers and fruit of which are represented in 133. Then comes a *Dracæna* having broad leaves, followed by a large Cananga tree (*Cananga odorata*, Hook. f. et T. T., syn *Uvaria odorata*, Lam.)—see 346—with a Cinnamon Tree on the right, and Mandioc (*Manihot utilissima*, Pohl.) in the right corner.

342. **Foliage and Flowers of** *Poinciana regia*, Boj., with a tree of the same in the distance. Singapore. This handsome tree is a native of Madagascar.

343. **Rattans** (*Calamus* sp.), Climbers, *Vanda Lowii*, Lindl., and Ourang-Outang at home in the forest of Mattanga, Borneo.

344. **Open Seed-vessels of a Species of** *Sterculia* (*S. coccinea*, Roxb. ?), and an Urticaceous Plant in Flower. Sarawak, Borneo. See 460.

345. **Forest Scene,** Mattanga, Sarawak, Borneo. Buttressed Tree and Ourang-Outang.

346. **Flowers and Fruit of the Cananga** (*Uvaria odorata*, Lam.). Singapore. The highly-scented petals are much loved by the native ladies of the Malay Islands.

347. **Breadfruit** (*Artocarpus incisa*, L.), with a tree of the same in the background; painted at Singapore. The Breadfruit is a tree of moderate size, a native of the South Sea Islands, where its fruit forms the chief food of the inhabitants, answering in use and taste to our potato. A cloth is made from the fibre of the young trees; canoes from the trunks, and a kind of glue from

the sap. Fruit of the best varieties contain no seeds, and these varieties are propagated by suckers. The Breadfruit is now cultivated in many countries, including the West Indies, whither it was introduced four years after the first attempt in 1789 by Lieut. Bligh, of the ship "Bounty," whose crew mutinied after he had shipped his cargo of plants. Pitcairn island, in the South Pacific, is the home of the descendants of the mutinous crew. The Butterflies are *Papilio polytes.*

348. **Fruit of** *Sandoricum indicum Cav*, and Cock of the Rock (*Calyptomena Rafflesii*). Borneo. This fruit has an agreeable sub-acid flavour, and it is eaten in large quantities by the natives. The pulp mixed with rice and fermented furnishes an intoxicating drink.

349. **Orchids and other Flowers of Sarawak,** Borneo. The Orchid having large green-and-black flowers is *Cœlogyne pandurata*, Lindl.; the light-coloured one above on the left, *C. Lowii*, Paxt.; and intertwined with the first, *Cymbidium pendulum*, Sw. On the right the gorgeous clusters *Æschynanthus longiflora*, Bl.

350. **Foliage and Flowers of** *Medinilla magnifica*, Lindl., a native of Manilla, and perhaps the most gorgeous of all the numerous *Melastomaceæ.*

351. **Malay Houses and Creek.** A view from the Astana, Sarawak, Borneo, with Areca Palm and old Tree covered with Epiphytes in the foreground.

352. **"Bullock - Heart,"** *Anona reticulata*, L.), a tropical American Fruit, commonly cultivated in the tropics; and native "Gooseberry" of Sarawak, with Leaf Locust. In the West Indies the fruit of *Anona reticulata* is called Custard Apple, while in India the latter name is applied to the fruit of *A. aquamosa.*

353. **The Tappan-Tree** (*Dipterocarpea?*), Sarawak, Borneo. The smooth cylindrical trunks of this tree often

rise to a height of 100 feet without a branch, yet the Dyaks climb them in quest of the honeycomb that the bees delight to hang on the branches. They climb them at night, building a bamboo ladder as they go up by driving pegs in above their heads and tying the other end of the pegs to long slender bamboos, placed one over the other, and lashed together with pieces of bark. In this way they reach the top in a few hours and obtain large quantities of wax, which forms one of the principal sources of the revenue of the country.

354. **Flowers and Fruit of the Cocoa Tree** (*Theobroma Cacao*, L.). Singapore. This is a small tree, usually under twenty feet high, producing its flowers and fruit on the main stem and older branches. It is a native of tropical America, now cultivated in many other parts of the world. There are several other species of the genus, and it is probable that some of them yield a portion of the cocoa and chocolate of commerce. The common cocoa tree is usually cultivated under the shade of the tall Coral trees (*Erythrina indica*) and attains its full height and bearing in about eight years. Each fruit contains a large number of seeds packed in the apple-like pulp, which is much sucked by native children.

355. **Flowers of** *Tacca cristata*, Jack, and prickly Fruit of the Rambutan (*Nephelium lappaceum*, L.). The long thread-like organs are bracts which proceed from below the flowers.

356. **Orchid and Ferns of Sarawak,** Borneo. The Orchid is a species of *Eria*, and the ferns belong to the genus *Polypodium*.

357. **View of the Maharajah of Johore's House** from Major McNair's Garden, Singapore; with Durian (*Durio zibethinus*, L.), and Traveller's Tree (*Ravenala madagascariensis*, Sonn.) in the foreground, a small "Red Areca"

a little back, and an old Norfolk Island Pine (*Araucaria excelsa*, R. Br.) in the distance to the right of the house. See 370.

358. **Flowers and Fruit of the Carambola** (*Averrhoa Carambola*, L.) and Butterflies (*Amblypodia* sp.). Singapore. The Carambola is a small evergreen tree, and, like its only congener, the Bilimbi (166), a native of some parts of tropical Asia, and is often cultivated for its fruit, which makes excellent tarts. It will also take out stains. The Bilimbi has rather larger flowers, produced on the main stem.

359. **View in Singapore**, with Nyum-Nyum tree (*Cynometra cauliflora*, L.) bearing flowers and fruit on the trunk. This is one of the few arboreous *Leguminosæ* having a fleshy edible seed-vessel. See the young, tender foliage in 369.

360. **Jak fruit** (*Artocarpus integrifolia*, Willd.). Singapore. This is a much larger tree than the Breadfruit, of which it is a congener; the leaves are not lobed as in the latter, and the fruit is borne on short branches from the trunk and older branches. The fruit, too, is larger, sometimes weighing as much as sixty pounds; and it is a favourite article of food among the natives. The custard-like pulp is eaten raw; the large seeds are only eaten when roasted. An excellent birdlime is made from the milky sap. There is a specimen of the wood in the wainscot below, panel 103. Native of the Indian Archipelago.

361. **Flowers of Sarawak**, Borneo. The large inflorescence with orange-red leaf-like bracts is a species of *Clerodendron*, near *C. Bethuneanum*, Hook, in the "Botanical Magazine," plate 4485. Above, on the right, is a small white Passion-flower, and on the left flowers of probably some species of *Tabernæmontana*.

362. **View of the Hill of Tegoro,** Borneo, with tall Trunks left standing here and there, showing the character of the forest before the quicksilver mines tempted civilised men to come and destroy it.

363. **Moonlight View** from the Astana, Sarawak, Borneo.

364. **Red Water Lily** (*Nymphœa Lotus*, L., syn. *N. rubra*, Roxb.) of Southern India. Painted at Cochin.

365. **A Maritime Plant,** *Ipomœa Pes-Capræ*, Sweet. A very common and widely-diffused plant on sandy sea-shores in the tropics.

366. **Durian Fruit** (*Durio zibethinus*, L.) from a large tree. Sarawak. The Durian is regarded as the king of fruits by the Malays, and most persons agree that it has a very delicious flavour; but it likewise has a very unpleasant smell, which few Europeans overcome. The custard-like pulp in which the large seeds are embedded is the part eaten fresh, while the outer covering is boiled down and used as a wash for the skin. The seeds are pounded into flour, and also used as Vegetable Ivory. For a portrait of the tree see 357.

367. **Foliage, Flowers, and Fruit** of a Swamp Shrub (*Wormia* sp., *W. excelsa*, Jack?). Borneo.

368. **View of Mattanga,** Borneo, with an Epiphyte twined around one of the trees in the foreground. These stranglers often survive after their victims (the trees upon which they germinated and commenced life) have rotted away, standing like gigantic lattice-work shafts, crowned with a tuft of green leaves. See description of 603.

369. **Walk under Wild Palms,** with a glimpse of the river at Sarawak. Observe the red-tinged young foliage of the Nyum-Nyum (*Cynometra cauliflora,* L.) beyond the palm on the left. See 359.

370. **View of Kuching and River,** Sarawak, Borneo. The plant with Banana-like foliage on the left is the Madagascar Traveller's tree (*Ravenala madagascariensis,* Sonn.) It belongs to the same natural order as the Banana; but instead of yielding food it affords water to the thirsty traveller. The water is stored in the sheathing bases of the leaves, and it is obtained by tapping. Behind the Traveller's tree are some cocoa-nut palms; in the water in front *Nipa fruticans,* Wurmb., with bamboo on the right. See description of 411.

371. **View of the River** from the Rajah's garden, Sarawak, Borneo, with *Crinum augustum,* Roxb., Bamboos, Durian and Mango trees, &c., in the foreground.

372. **Limestone Mountains of Sarawak,** Borneo, with leafless flowering branches of a tree (*Sterculia* sp.) of the region in front, and tree of the same glittering in the distance. Below, on the left, remains of its old seed-vessels.

373. **Old Boat-house,** Sarawak, Borneo, with trunk of Cocoa-nut Palm, Areca and Sago Palms, Nipa, &c.

374. **Flowers and Fruit** of the Pomelloe, a variety of Shaddock (*Citrus decumana,* L. var.), and flowering branch of Hennah (*Lawsonia inermis,* L.), with Flying Lizard. Sarawak, Borneo. Hennah yields a dye much used by Eastern ladies to dye their eyelids, finger-nails, &c. The lizard was dead when painted. When alive it is beautifully coloured.

375. **The Astana,** from the Slanting Bridge, Sarawak, Borneo, with *Gardenia, Crinum, Nipa fruticans,* Palms and Bamboos in the foreground. Consult description of, 399.

376. **Group of Free Ferns** around the spring at Mattanga, Sarawak, Borneo.

377. **A Bornean Pitcher Plant** (*Nepenthes,* species undescribed?). Sarawak. The green inside of the pitchers, with two darker green spots or eyes just under the lid, is a noteworthy character of this species. The species of *Nepenthes* are scattered from North India and China to Ceylon, Madagascar, and through the Malayan Archipelago to North Australia; but it is only in Borneo and Malay Peninsula that the speceies are numerous, and form a feature in the vegetation. About forty species are known. The pitchers, which are appendages of the leaves, should not be confounded with the flowers. See description of 378.

378. **Foliage, Pitchers, and Flowers** of a species of *Nepenthes,* and an Orchid in flower, Sarawak, Borneo. The flowers of most species of *Nephenthes* are less showy than the pitchers. They are unisexual; the males and females being in separate spikes and perhaps always on different plants. In this species the male flowers are purple-brown, with a central column of stamens terminating in a yellow knob. The orchid is apparently a *Vanda,* allied to *V. teres.*

379. **View of Mattanga and River,** Sarawak, Borneo, with Palms and Mangosteens in the foreground. Foliage and fruit of the Mangosteen are represented in 399.

380. **Lake of Ajmere,** India.

381. **Flowers of a Jessamine** (*Jasminum gracillimum*, Hook. f.) and a pink *Begonia*. Borneo.

382. **Flowers of** *Cornus capitata*, Wall. (syn. *Benthamia fragifera*, Lindl.) and a species of Wild Indigo (*Indigofera* sp.) Himalaya. The flowers of the Cornus are quite small and many crowded together, each head being subtended by four coloured bracts, that look very much like petals. This shrub bears an edible fruit not unlike that of the strawberry tree (*Arbutus Unedo* L.), hence the name *fragifera*.

383. **Pitchers of** *Nepenthes Northiana*, Hook. f., from the limestone mountains of Sarawak, Borneo. This has the largest pitchers of any known species, except *N. Rajah*, Hook f. In consequence of seeing this painting, Messrs. Veitch sent a collector all the way to Borneo on purpose to get the species, and he succeeded in bringing home living plants of it.

384. **A Verbenaceous Plant** (*Stachytarpheta mutabilis*, Vahl.), used in the ceremonies of Indian sorcerers, and a pair of Honeysuckers (*Nectarinia*, sp.) Sarawak, Borneo. The genus *Stachytarpheta* is numerous in species, all of them native of America, and this, though now common in the tropics of the Old World, was most likely originally introduced from America.

385. **A Mangrove Swamp** in Sarawak, Borneo. Various trees and shrubs belonging to different natural orders, that constitute the vegetation of the tidal swamps of warm countries, are called Mangroves; but the *Rhizophoreæ*, a small order, are all, or nearly all, maritime, and specially entitled to the name. The tree represented here is one of the commoner ones (*Rhizophora Mangle*, L.). Each branch bears a cluster of leaves and flowers at the tip; and each flower produces

one seed. But the most remarkable thing in the economy of this and other Mangroves is the provision for their reproduction from seed. Instead of the fruit falling or the seed falling from the fruit or seed-vessel when ripe, as most seeds do, the seed germinates in the seed-vessel while it is still attached to the mother-plant; its root growing out at the top, as shown of the natural size in the front of the picture. This root either goes on growing until it reaches the mud, or getting too heavy, the young plant drops from the mother-plant and sticks in the mud, where it soon unfolds its first leaves, and becomes established as an independent plant. In this way the Mangroves cover miles and miles of muddy swamp with a dense thicket of vegetation, gradually extending seaward and reclaiming more land.

386. **View from Mattanga** over the Great Swamp, with shawdow of hills at sunset. Sarawak, Borneo.

387. **Palawen Trees,** Sarawak, Borneo. This tree is easily recognised in the landscape, as it sheds its bark like an Arbutus, leaving the trunk a deep red. We have not been able to ascertain its botanical affinity.

388. **View from the Astana,** Sarawak, Borneo, with Duca or Dookha fruit (*Lansium*, sp. ?) in front.

389. **Sago Palms** (*Sagus lævis*, Rumph.) in flower, with a glimpse of the river at Sarawak, Borneo. The word *Sagus* is said to be derived from *Sago* or *Saga*, which in the language of the Papuan race signifies bread, and is given to the two Palms *Sagus lævis* and *S. Rumphii*, from which the greater part of the sago of commerce is obtained. Sago itself is obtained from the soft inner portion of the trunk, and is extracted by pounding and washing. Refer to the description of 432.

390. **View down the river at Sarawak,** Borneo, with Boathouse and Palms (*Areca Catechu,* L.) in the foreground.

391. **Pitcher Plants** (*Nepenthes* spp.), with Fern behind, Sarawak, Borneo. The pitchers on young plants usually differ very much in shape and colouring from those of adult plants.

392. **Another Species of Pitcher Plant** (*Nepenthes Rafflesiana,* Jack.), Sarawak, Borneo.

393. **A Clump of Screw Pine** (*Pandanus,* sp.) and red-stemmed Palm (*Pinanga,* sp.), with a glimpse of the river, Sarawak, Borneo. A strong fibre is obtained from the leaves of some of the Screw pines; and sugar bags are made of the leaves of *P. utilis,* a Mauritian species.

394. **Leaf Insect.** See description of 498.

395. **Mouth of the Kuching River,** Sarawak.

396. **An Anonaceous Tree** (*Anona,* sp.?) in flower and fruit, Sarawak. The flowers, although green in colour, are very sweet-scented.

397. **Foliage and Fruit** of a Meliaceous tree (*Amoora Aphanamixis,* Rœm. & Schult., syn. *Aphanamixis grandifolia,* Bl.) of Java.

398. **Group of Wild Palms** (*Areca,* sp. &c.), Sarawak.

399. **Flowers and Fruit** of the Mangosteen (*Garcinia Mangostana,* L.), and Singapore Monkey. The Mangosteen is a native of Malacca, and it is esteemed by many as the best of all tropical fruits. Its white kernels are juicy like the grape, and are apt to leave a stain on anything they touch, which may be removed by rubbing with the pink rind. See 379.

400. **Bitter Wood** (*Quassia amara*, L.) in flower and fruit, painted at Sarawak. This is a tropical American tree, cultivated in various parts of the world for its medicinal properties. "Quassia chips" are the product of this tree.

401. **Tree covered with Epiphytes,** and an overhanging Palawen tree, on the river at Sarawak. See 387.

402. **View of Singapore,** from Dr. Little's garden, with red-stemmed Palm (*Pinanga*, sp.) and Wine Palm (*Caryota urens*, L.) in the foreground. Toddy, or Palm Wine, an intoxicating drink, is made from the latter; and sugar is obtained from the same by boiling and evaporation. A good tree will yield 100 pints of sap in twenty-four hours. Ropes and oakum for caulking are made from the fibre at the base of its leaves. For further particulars the reader is referred to the description of 492.

403. **Flowers of** ***Mussænda macrophylla*****,** Wall. with two Butterflies (*Orinthoptera Priamus*) settling upon the flowers; and *Clerodendron fallax*, Lindl., in flower and another species in fruit. Sarawak. The flowers of the *Mussænda* are very curious, having small reddish corollas, and one of the calyx-lobes of some of the outer flowers of the cluster grown out into a white leaf-like organ. The blood-red blossoms of the *Clerodendron* are used by the Dyaks for dressing the heads and trophies brought home from battle.

404. **Flowers and Fruit of the Doctors' Tree** (*Rourea* sp.), Sarawak, Borneo. This tree is a member of the *Connaraceæ*, a small order allied to the *Leguminosæ*,

405. **Areca, or Betel-Nut Palm** (*Areca Catechu*, L.), Singapore. This palm is extensively cultivated in tropical Asia for its seeds, which are cut in slices and rolled in the leaves of species of Piper and chewed with lime. See 320 and 423.

406. **The Quicksilver Mountain of Tegoro,** Sarawak, by moonlight.

407. **An Orchid** (*Arachnanthe moschifera*, Blume ?), Singapore. The central petal (*labellum*) is Vanilla-scented, and when this is removed the flowers are scentless.

408. **Two Cultivated Plants.** The central plant, having long leaves, purple beneath, and a curious inflorescence enclosed in two bracts resembling a bivalve shell, and on that account sometimes called the Oyster Plant, is *Rhæo discolor*, Hance, better known in gardens as *Tradescantia discolor*, L'Hérit.; and the lily-like flowers in front are those of a species of *Zephyranthes.* Behind and above may be seen the delicate foliage and rosy balls of minute flowers of one of the Sensitive Plants (*Mimosa sensitiva*, L. ?), a common weed in hot countries.

409. **Foliage, Flowers, and Seed-vessels** of one of the Peruvian Bark trees (*Cinchona Calisaya*, Wedd. var.). There are several species of the genus yielding bark of different qualities, and they are all natives of Peru, Bolivia, and the adjoining countries in South America, where, however, they have become very scarce in the accessible districts; but the English in the mountains of India, Ceylon, and Jamaica, and the Dutch in the mountains of Java, have for some years successfully cultivated the most valuable kinds. Several different alkaloid substances are extracted from Peruvian bark, including

quinia; and this, in combination with sulphuric acid, is the quinine, or "sulphate of quinine," of the druggists—one of the most valuable medicines known as a remedy for fevers, &c.

410. **Group of Cultivated Flowers.** In the foreground a *Dendrobium* and a *Brownea,* with a Passion-flower, a white-flowered *Bauhinia,* a *Crinum,* and *Ixora coccinea,* L., &c., in the jar.

411. **Nipa, or Susa** (*Nipa fruticans,* Wurmb.) Borneo. Inflorescence of the natural size in front, with a portion of a leaf behind, and the growing plant in fruit in the distance. This somewhat anomalous-looking Palm is very common in the muddy estuaries of rivers and in tidal swamps in eastern tropical Asia; and it is the most valuable of all growing things to the Dyaks of Borneo. Their huts are framed and floored with its leaf-stalks, roofed and matted with its leaves; from its juices they extract salt and sugar and make a kind of wine; and from its seed an oil is extracted. Vinegar and yeast and a strong spirit are also among the articles prepared from the products of this plant. The seeds are solitary in the nuts, which are clustered in huge balls as large as a man's head. The seeds, it is recorded, lie dormant in the fruit several years before germination, when the fruit becomes detached from the plant and is floated off by the tide to establish itself on some other mud-bank. This plant only grows where fever and mangroves flourish. Its tall feathery leaves are from fifteen to thirty feet high.

412. **The Moth Orchid]** (*Phalænopsis amabilis,* Bl.), with the beautifully variegated foliage of a species of *Anæchtochilus,* and a spray of the beautiful pink-flowered American climber, *Antigonon leptopus,* Hook. Singapore.

413. **Roadmaking** in the Tegoro Forest, Sarawak, Borneo.

414. **Two Indian Climbing Shrubs**: *Quisqualis indica*, L. with red and white flowers, and *Meyenia erecta*, Benth. Singapore.

415. **Orchids of Sarawak**, Borneo: *Dendrobium superbum*, Rchb. f., having purple flowers with a darker lip; and *Calanthe vestita*, Wall., white and orange.

416. **Foliage and Flowers** of *Amherstia nobilis*, Wall., a tree of Burma; painted at Singapore. This tree has perhaps the most magnificent flowers of any member of the large Natural Order, *Leguminosæ*, to which it belongs. The Burmese call it *Thaw-ka* or *Soka*, and handfuls of the flowers are offered before the images of Buddha.

417. **Bornean Orchids.** In the lower left corner, *Cypripedium Hookeræ*, Rchb. f., with spotted leaves, and above it, *C. Lowii*, Lindl., with a white-flowered *Cœlogyne* on the right, and *Sarcanthus*, sp.?

418. **Flowers and Fruit** of *Barringtonia speciosa*, Forst., Borneo. A tree of the Myrtle order, common on the sea-shore of the Malayan Islands. A kind of lamp oil is expressed from the seeds, and mixed with bait it is used to inebriate fish in order to facilitate their capture. The Butterfly is *Diadema bolina*.

419. **Foliage and Fruit** of the Gourka or Goraka, (*Garcinia Xanthochymus*, Hook. f.). The fruit is hidden beneath the dense screen of foliage, and can only be seen by lifting it aside.

420. **Stagshorn Fern** (*Platycerium grande*, J. Sm.), and the Young Rajah of Sarawak, with Chinese attendant. This remarkable fern is of a prodigious size, and bears two kinds of fronds, fertile and sterile, the former being pendent and divided into narrow segments.

421. **A Bornean Flower,** *Crinum augustum,* Roxb., one of the handsomest of this fine genus of *Amaryllidaceæ.* Entire plants are represented in 371.

422. **Foliage and Flowers** of *Solandra grandiflora,* Sw., a shrub of tropical America, resembling *Datura arborea,* L., and a member of the same Natural Order, namely *Solanaceæ,* with Honeysuckers (*Nectarinia* sp.).

423. **Flowers and young Fruits** of the Areca Palm (*Areca catechu,* L.). See description of 320, and, for portrait of the Palm itself, 405.

424. **A Bornean Flower,** *Crinum Northianum,* Baker. This plant is common enough in Borneo, yet it was not previously known to botanists.

Around the doorway, beginning in the centre, are the blue flowers of *Vanda cærulea,* Griff., from India, associated with foliage and flowers of the Tea shrub, *Camellia theifera,* Griff., from China, foliage of *Acer palmatum,* Thunb., from Japan, and autumn foliage of the Ginkgo (*Salisburia adiantifolia,* Sin.), with Barberry (*Berberis vulgaris,* L.), *Chrysanthemum* and Japanese creeper (*Ampelopsis tricuspidata,* S. & Z.) on the right; and Pepper (*Piper nigrum,* L.), a flower-head of a Marguerite, and *Cissus discolor,* Blume, from Borneo, on the left. One of the tendrils of the Cissus is so turned as to form the word Brooke in compliment to Margaret, daughter of Rajah Brooke, whose hospitality the artist enjoyed in Borneo.

On the left panel of the door is a festoon of *Stephanotis floribunda,* Brongn., a native of Madagascar, commonly cultivated in this country for bridal bouquets, &c.; and on the right is the beautiful New Zealand *Clianthus puniceus,* Banks. and Sol., whose only congener is represented in 540. It is remarkable as one of the very few leguminous plants in New Zealand.

425. **Specimens of the Coquito Palm** (*Jubœa spectabilis*, H. B. K.) of Chili, in Camden Park, New South Wales, where they were planted fifty years ago by Sir W. Macarthur. This Palm, which is the most southerly representative of the Order in America, is remarkable for its stout trunk. In Chili a sweet syrup called *Miel de Palma*, or Palm-honey, is prepared from the sap, which is, or was, much esteemed for domestic use as sugar.

426. **Foliage of the Gutta Percha** (*Dichopsis Gutta*, Benth. syn., *Isonandra Gutta*, Hook.). Much of the gutta-percha imported from Singapore and the Malay Islands is the inspissated sap of this tree; but many allied species afford a similar product.

427. **Foliage, Flowers, and Fruit** of the Sapodilla Plum (*Achras Sapota*, L.), a native of tropical America, now cultivated in other parts of the world. An excellent fruit, tasting like a medlar. The bark of this tree is said to be a good substitute for quinine.

428. **View near Garoet** with wild Bananas on the left, and Coffee bushes on the right. For flowers and fruit of Coffee see 167.

429. **River Scene at Sarawak,** Borneo, when the tide is getting low. A boat-builder's house surrounded with Palms, Bananas, and Bread-fruit trees. On the water a cocoa-nut shell full of burning oil, which is supposed to be carrying off the Bad Spirit from some sick-house to the sea.

430. **The Avocado or Alligator Pear** (*Persea gratissima*, Gært.), a member of the Sweet Bay order, native of tropical America, where, as well as in other countries, it is commonly cultivated. Though strangers do not at first relish the fruit, it is highly esteemed, especially in the West Indies and America, where it is

usually eaten as a salad with meat. It has a firm pulp possessing a buttery or marrow-like taste; hence it is frequently called Vegetable Marrow and Midshipman's Butter. Oil is obtained from the pulp by expression, and used in soap-making; and the seeds yield an indelible black juice used as marking ink. The gigantic moth is *Tropæa selene.* Painted in Java.

431. **Tea Gathering** in Mr. Hölle's plantation at Garoet in Java, with a distant view of the volcano of Goentoen. In the right foreground Coffee bushes, a Cypress, and some trees of *Canarium commune*, L.

432. **A Tailor's Shop in the Botanic Garden,** Buitenzorg, Java, shaded by Sago Palms (*Sagus lævis*, Rumph.) and Bananas. The Sago Palm attains a height of about thirty feet in fifteen years, and then sends up a large terminal inflorescence. Before this matures the tree is cut down and the pith taken out and prepared by much washing for export or home use. Wallace says that one tree will supply a man with a whole year's food. Look at 389.

433. **Foliage, Flowers, and Fruit** of a species of *Vanilla.* Several species of this genus are cultivated for the fruit or seed-vessel, which is used to scent and flavour delicate sweetmeats and beverages. It is worthy of note that the genus *Vanilla* is one of the very few genera of Orchids inhabiting tropical regions that are represented by indigenous species both in America and the Old World.

434. **Cobweb Bridge** in Borneo, made by the Dyaks with rattans (stems of climbing Palms—*Calamus* spp.) and bamboos. Only one of the latter is provided for foot-hold, but it is so cleverly fastened that even Europeans in shoes can cross it, if not too giddy from the swinging motion.

435. **Foliage, Flowers, and Young Fruit** of the Pepper bush (*Piper nigrum*, L.) The Pepper bush is a native of Malacca and the Malayan islands. White and black pepper are from the same plant. Whole black pepper is the fruit just as it is taken from the plant, and white pepper is the same thing with the outer skin of the fruit removed.

436. **The Turong, or Bird-Orchid** (*Cælogyne*?) and a purple-brown *Cymbidium*, perhaps *C. pendulum*, Swartz. The former comes into blossom simultaneously on all the plants three times a year, and the trees and roofs on which it grows seem on those days to be covered with snow, which on the morrow all melts away.

437. **Collection of Fruits**, painted at Lisbon. Unfamiliar ¡to most English people is the long purple Aubergine or Egg-plant (*Solanum esculentum*, Dun.), as well as the large red Pimento, a variety of Capsicum.

438. **Group of Bornean Plants.** At the bottom on the left is the singlar Aroid (*Gamogyne Burbidgei*, N. E. Br.) with rosy crimson spathes; above, a species of *Pollia* (*Commelinaceæ*), bearing blue berries, with the clustered yellow fruit of some *Anonacea*, and below the beautiful variegated foliage of a species of *Piper*, which is, or was, cultivated in this country under the name of *Cissus porphyrophyllus*.

439. **Foliage and Fruit** of the Kanari or Java Almond (*Canarium commune*, L.) and Butterfly (*Pieris* sp.). The nuts are so hard that only the Black Cockatoo can crack them; and this he ingeniously manages, according to Wallace, by first stuffing one of the leaves into his large beak, for the purpose of steadying the nut. Kanari timber is most valuable.

440. **Houses and Bridges** of the Malays at Sarawak, Borneo.

441. **View of the Salak Volcano,** Java, from Buitenzorg. Like most of the volcanoes in Java, it is dotted with the richest forest up to the very edge of the crater, interrupted here and there only by patches of Cinchona, Coffee, and Tobacco cultivation, and lower down by terraces of Rice and Indian Corn. In the immediate foreground are Cocoa-nut Palms, Bananas, Bamboos, and Mango trees; and the same trees, associated with the Bread-fruit and Sago Palms, border the river.

442. **The Great Square of Malang,** Java, planted with Urena trees, a kind of Fig (*Ficus Benjamina*, L.), and bullock carts beneath their shade.

443. **The Papandayang Volcano,** Java, seen from Mr. Hölle's tea plantations, with a rich plain intervening, watered from the hot springs.

444. **Another View of Papandayang,** with Coffee Tree in the foreground.

445. **The Soembing Volcano,** Java, with plantation of Teak trees, and the artist's home for ten days, seen from the top of the Boro Bodor. See the description of 458.

446. **Curious Plants from the Forest of Mattanga,** Sarawak, Borneo. On the left, attached to a trunk, are the bladder-like leaves of a species of *Dischidia* (*Asclepiadeæ*); and the red ribbon-like bodies bearing numerous small flowers are the inflorescences of *Pterisanthes cissoides*, Blume, a climbing shrub, in floral structure closely allied to the Grape Vine. The little plant in flower at the bottom on the right is *Didymocarpus reticosus*, C.B.C., associated with coloured-leaved Begonias and other plants.

447. **Foliage and Flowers** of *Sesbania grandiflora*, Pers., a small ornamental tree commonly cultivated in the gardens of South India, the Malay Islands, &c. The tender leaves, flowers, and young pods are all eaten by the natives of India in their curries, and the very bitter bark is used as a tonic. There is a variety having white flowers.

448. **Palms in the Botanic Garden** at Rio Janeiro.

449. **Blue-flowered Climbing Shrub** (*Thunbergia grandiflora*, Roxb.) and a common Swamp Plant (*Fagræa*, sp.) of Sarawak, Borneo.

450. **Wild Flowers of Sarawak**, Borneo. In the centre a handsome species of *Cœlogyne*, with the young inflorescences of a Zingiberaceous plant behind; Pitchers of a species of *Nepenthes*, and a small purple-flowered *Dendrobium secundum*, Wall., lying in front.

451. **India-rubber trees** (*Ficus elastica*, Roxb.) at Buitenzorg, Java. For some particulars respecting this tree the reader is referred to the description of 274. It is a native of Assam in North India, and is remarkable for the large buttresses it forms.

452. **Village of Mat Houses**, near Garoet, Java. Observe the houses are raised on piles above the ground, so that the air can circulate beneath the floors.

453. **Flowers and Fruit of the Jamboa Boll** (*Eugenia* sp.) Java. The fruit is sweet, like a pear.

454. **Young Leaves and Flowers and Fruit** of Cotton tree (*Eriodendron orientale*, Steud.). The seeds are densely clothed with silky-white hair, which is used to stuff pillows, &c.; and in Java the trees themselves are

used as telegraph posts, as the branches grow so conveniently at right angles to the trunk that they do not interfere with the wires.

455. **Rice Harvest,** near Bandong, Java. The working buffaloes, though very savage towards men, get fond of the boys who drive them and sit constantly on their backs, and have been known to fight wild beasts in their defence.

Rice (*Oryza sativa*, L.), is now very generally cultivated in warm countries, and it is the staple food of a larger number of the human race than any other grain. In some parts of India and China it is almost the only food of millions of people.

456. **Foliage, Fruit, and Flowers** of the Jamboa Flambok (*Eugenia malaccensis*, L.), Java. Fruit edible.

457. **Tea-drying** in Mr. Hölle's establishment, Java.

458. **The Volcanoes of Merapi and Merbaboe,** Java, from the top of Boro Bodor; the rich plain at their feet covered with morning mist; the tops of the Cocoa-nut groves alone showing above it, and indicating the position of the numerous native villages. In the foreground are some of the 400 life-size statues of Buddha, amidst their shattered dagobas, which adorn the wonderful pyramid and its seven steps or terraces. They contain the whole history of the holy man, illustrated in the finest bas-relief, and if stretched out would measure three miles in length. The building was commenced apparently in the fifth or sixth century, and may have been in progress 200 years before it was completed.

459. **Plants of Sarawak.** On the left the bold, longitudinally-ribbed foliage of a *Melastomacea*, with a vine in fruit, the name of which we have not determined; and

the small cluster of scarlet flowers belongs to a species of *Globba*, perhaps to *G. bulbifera*.

460. **Foliage and Fruit** of a species of *Sterculia*, the lower seed-vessels ripe and open, exposing the seeds to view. Each cluster of seed-vessels is the product of a single flower. See 344.

461. **Japanese Flowers**—*Forsythia* (yellow), *Azalea*, *Camellia*, and *Pæonia*. The variegated foliage at the top is of *Eurya japonica*, Thunb., a shrub belonging to the same Natural Order as the Camellia.

462. **Foliage, Flowers, and Fruit** of a species of *Eugenia* growing at Sarawak, Borneo.

463. **Japanese Chrysanthemums**, cultivated in this country.

464. **Rice Drying** on the sea-shore near Yokohama, Japan.

465. **Gate of the Temple of Kobe**, Japan, with a Wistaria (*Wistaria chinensis*, Sieb. et Zucc.) trained over it, and a noble Camphor Tree (*Cinnamomum Camphora*, Nees) behind it.

466. **A Clearing in the Forest of Tchi Bodar**, Java, with bank of Tree Ferns.

467. **Two Flowering Shrubs of Java**, *Strophanthus dichotomus*, DC., and *Lagerstræmia indica*, L. The five-tailed corollas of the first are singular, as well as its large seed-vessel, which consists of two carpels spread out horizontally; and the wavy-petalled, rosy flowers of the latter are not unfamiliar in the greenhouses of this country.

468. **The Gader Volcano,** Java, from Sundung Laya, with a young *Casuarina, Aralia,* and *Datura arborea* in the foreground.

469. **View from the Artist's Window at Buitenzorg,** Java, with Cocoa-nut Palms, Bananas, Breadfruit trees and Coffee bushes.

470. **Roadside View** from Sundung Laya, Java, with Rice-paper tree (*Fatsia papyrifera,* Dcne.) in the foreground on the right.

471. **Village of Tosari,** Java, 6,000 ft. above the level of the sea, with Casuarina trees, and the smoke of the Volcano Semiroe rising above the hill. Here are the gardens which supply all the European vegetables to the towns below.

472. **Zedoary** (*Curcuma Zedoaria,* Roscoe?) and a Climbing Shrub (*Ceropegia,* sp.) with Leaf Insects. Java. The corolla of the *Ceropegia* is remarkable in having the narrow ends of the lobes united at the tips, whereas they are free in the allied *Strophanthus* in 467. Zedoary root is used medicinally.

473. **Cycads** (*Cycas revoluta,* Thunb.) and Dwarf Plants on Rocks in the Garden of the Nishihongwange Temple, Kioto, Japan.

474. **Entrance to the Temple at Kobe,** Japan. In the foreground on the right is the Sacred Horse, an albino with blue eyes and a pink nose, and hoofs turned up from want of exercise. He is fed by the true believers with beans, which are kept ready in saucers near him; and a piece of money is left in their place. He is always kept tied up in readiness, in case the god should come earthward and want a ride. Near him is a stuffed horse-skin, so that even if he died the god would not be

horseless. On the left in the middle distance is an old Candle tree (*Stillingia sebifera*, Sieb. et Zucc.) with tufts of a Sumach upon it.

475. **The Hottomi Temple** at Kioto, Japan, with a Pine tree trained as an espalier in front, and autumn tints in the background.

476. **Temple over the Great Bell of Chion-in**, Kioto, Japan. This bell is eighteen feet in diameter.

477. **Interior of the Chion-in Temple**, Kioto, Japan.

478. **Small Temple of Maruyama** at Kioto, Japan, with *Cryptomeria japonica*, Don, and Bamboos in the background. The form of devotion practised at this temple consists in running round it one hundred times, and dropping a piece of wood into a box each time the worshipper passes it.

479. **View of the City of Kioto**, Japan, in the morning mist. Taken from outside of the Artist's paper window. In the foreground, on the right, is the top of a pine tree, clipped and trained so as to resemble a bank of turf from where the artist sat.

480. **Distant View of Mount Fusiyama**, Japan, with Flowers of *Wistaria chinensis*, DC. in front. This beautiful, hardy, climbing shrub is a native of China and Japan, and was introduced into this country about the year 1816. The original plant was nearly killed through being kept in a hot-house.

481. **Japanese Flowers**, painted from plants cultivated in this country. On the left are the familiar mottled leaves of *Aucuba japonica*, Thunb., bearing a cluster of the less familiar red berries, with a group of

single and semi-double varieties of *Camellia japonica*, L., and the charming *Pyrus japonica*, Thunb., on the right. The female Aucuba has been cultivated in England nearly a century, but it is only since the introduction of the male plants, about twenty years ago, by Mr. Fortune, that berries have been seen.

482. **Foliage and Flowers of an Indian Evergreen Shrub** (*Beaumontia grandiflora*, Wall.). At first sight this reminds one of the Himalayan *Rhododendron Aucklandi.*

483. **Study of Japanese Chrysanthemums and Dwarfed Pine Tree in Pot.** The Japanese delight in dwarfing big trees; and they have brought the art to such a degree of perfection that they can keep them down to the size of the one represented, even to the age of fifty years. In this condition they are perfect miniatures of trees, bearing all the knots and markings of their age.

484. **Pitchers of young Plants of a Species of** *Nepenthes*, and a Spike of ripe Seed-Vessels of the same in front. Java.

485. **Pawan Dufur,** a Temple strangled by a large Cotton tree (*Eriodendron orientale*, Steud.). Java.

486. **Java Flowers,** *Agalmyla staminea*, Blume, with an Orchid and the trailing Campanulacea (*Pratia begoniæfolia*, Lindl.) in front.

487. **Banyan Trees** (*Ficus bengalensis*, L.), at Buitenzorg, Java. Roots descend from the branches of this tree on all sides, and after penetrating the ground they enlarge and grow into stems three or four feet or more in girth. In this way a tree spreads and spreads until it forms a little forest in itself. See 339 and 499.

488. **Palms in the Botanic Garden,** Buitenzorg, Java. In the centre are two small ones, having huge fan-shaped leaves. These are the famous Double Cocoa-nut, or Coco de Mer (*Lodoicea Seychellarum*, Lab.) and they are already thirty years old, though they have not yet begun to form a trunk. This Palm inhabits only two or three small islands of the Seychelles group; but long previous to the discovery of this group in 1743, its enormous nuts had been found floating in distant parts of the sea, giving rise to absurd and fabulous tales concerning their origin. Formerly, too, they were supposed to possess marvellous medicinal virtues. Specimens may be seen in No. 2 Museum. As in the Date Palm, the male and female flowers are borne on separate trees. The male trees of the Double Cocoa-nut are said to grow as much as 100 feet high; but the females are not so tall.

489. **Cascade at Tchi Bodar,** Java, with Tree Ferns in the foreground.

490. **View from Malang,** Java, with Mat Houses, and a large Fig Tree (*Ficus Benjamina*, L.) in the foreground.

491. **Japanese Persimmon or Kaki Fruit** (*Diospyros Kaki*, L., fil.). Several varieties of this fruit are cultivated both in China and Japan; and some of them have been imported, and are now cultivated in the South of Europe. In flavour they resemble a plum, and they are eaten fresh or sun-dried.

492. **The Talipot Palm** (*Corypha umbraculifera*, L.) of Ceylon in Flower and Fruit, and Wine Palm (*Caryota urens*, L.) in Flower at Buitenzorg, Java. Under 304 will be found an account of the mode of flowering of

the Talipot Palm; and that of the Wine Palm is equally curious. When the tree has attained a certain age, and a height of forty to sixty feet, it throws out a large cluster of flowers from the axil of the topmost leaf, and this is succeeded by cluster after cluster, alternately male and female, each one lower than the one before it, until the lowest leaf-axil is reached, when the exhausted tree dies. See also 402.

493. **Foliage of a Species of** *Cinnamomum*, a Flower of *Clitoria Ternatea*, L.; and Atlas Moth (*Saturnia* sp.) with its Caterpillar and Chrysalis.

494. **Flowering Branch of** *Rhododendron javanicum*, Benn., with *Ipomoea Bona-nox*, L., below. The genus *Rhododendron* has a wide range in the Old World, from the Alps of Europe to China and Japan, and southward to Java, Borneo, &c.; but the greatest concentration of species is in the mountains of Northern India, where also the finest species grow. A few species inhabit North America. The *Ipomoea* received its specific name *Bona-nox*, "good-night," in allusion to its opening its flowers in the evening.

495. **Leaf and Inflorescence of a Gigantic Aroid** *Amorphophallus campanulatus*, Blume). Java. Previous to the bursting of the spathe containing the spadix, which takes place suddenly about sunset, there is an accumulation of heat therein. When it opens it exhales an offensive odour that is quite overpowering, and so much resembles that of carrion that flies cover the club of the spadix with their eggs.

496. **Hindoo Idols and Frangipani Trees** (*Plumeria*, sp.), at Singosari, Java.

497. **Inflorescence of a Plant** of the Ginger Family

(*Amomum*, sp.?) The flowers are in dense clusters, which proceed from the trailing, partly underground stem ; and the ripe seed-vessels are sweet and juicy like grapes. Java.

498. **Leaf-Insects and Stick-Insects.**—The singular forms assumed by these insects have suggested the names leaf-insect, stick-insect, &c., and these names are most appropriate, for the insects so closely resemble the twigs and leaves of plants on which they live, that they seem to form part of them. These adaptations, or resemblances between the insects and the plants they feed on, serve to guard the insects against extermination by their enemies. "It is thus," says the eminent traveller and naturalist, Mr. Bates, "That from the *Phasma* type "have been produced the narrow, green or yellow, "wingless *Bacilli*, with their habit of stretching out "rigidly their elongated limbs when clinging to a plant, "so as to assume the appearance of a slender stem—the "flattened and rugged-lobed, mossy-looking *Prisopi* and "*Creoxyli*, which, when the wings are folded, cannot "be distinguished from a piece of lichen-covered bark—"the flattened *Phyllium*, which, as everyone knows, "cannot be distinguished from a leaf of the tree on "which it crawls—and so forth, the adaptation of "general form carrying with it modification of limbs and "appendages." The *Phasmidæ* are numerous, some 600 species having been described, and they are widely dispersed in warm countries.

499. **Old Banyan Trees** (*Ficus bengalensis*, L.), at Buitenzorg, Java. See the description of 339.

500. **Bamboos and Cocoa-nut Palm** on a Stream, with Carrion Crows watching Malays in the butchery. Java.

501. **The Ardjuno Volcano** from Tosari, Java, with Tree Ferns and Casuarinas in the foreground.

502. **View from the Bridge of Magelang,** Java, with Men removing a Mat House. Palms, Bananas, and Fruit Trees.

503. **Foliage and Inflorescence** of a Climbing Aroid (*Rhaphidophora decursiva,* Schott), with a nest of White Sparrows (*Padda orizivora*) in Trunk of Tree. Java.

504. **Group of Palms** in the Botanic Garden, Buitenzorg, Java.

505. **Foliage, Flowers, and Fruit** of *Saraca declinata,* Miq. (syn. *Jonesia declinata,* Jack), Java.

506. **Foliage, Flowers, and Fruit** of the Sacred Lotus (*Nelumbium speciosum,* Willd.). Java. Its roots and seeds were eaten by the Egyptians in the time of Herodotus, as they are at the present time in India; but it long ago disappeared from Egypt—how long ago, it is impossible to say. Its petals are astringent. The fruit, however, is the most remarkable part of this plant. A number of separate carpels, each containing a single seed, are immersed in the funnel-shaped receptacle; and when ripe they are loose in the sockets, so that when the fruit is shaken they make a noise like a rattle. Further particulars respecting this interesting plant are given in the description of 314. It flowers freely every season in these gardens.

507. **Idols and Temple at Brambanang,** Java.

508. **Volcanoes from** Temangong, with Sugar Palms (*Arenga saccharifera,* Lab.) in the foreground. Java. The trunk of the dead palm soon becomes hollow, and furnishes very durable underground water-pipes. The

pith yields sago; and the black fibre obtained from the leaves and used as cordage is noted for its power of resisting wet. Finally, the sap yields toddy and sugar.

509. **Foliage and Fruit** of a small Screw Pine (*Pandanus*, sp.). Java.

510. **Foliage, Flower-buds, and Flowers** of the Clove (*Caryophyllus aromaticus*, L.); Fruit of the Mango (*Mangifera indica*, L.); Hindoo God of Wisdom, and Bell. The cloves of commerce are the unopened flower-buds, and the tree that produces them is a native of the Moluccas, though now cultivated in the West Indies and other parts of the world. For further particulars respecting the Mango, see description of 327.

511. **Mat Houses** with Palms and *Datura arborea*, L., in the left foreground. Bandong, Java.

512. **The Mosque of Bandong,** Java. The large trees are a kind of Fig (*Ficus Benjamina*, L.) commonly planted for shade in this country.

513. **Statue of Buddha,** taken from the Great Pyramid of Boro Bodor, Java, with *Poinsettia* and *Iris* behind it.

514. **Ripe Fruit of Screw Pine** (*Pandanus odoratissimus*, L.), with a sprig of Sandal Wood behind. Lower parts of the drupes constituting the fruit edible, having the flavour of a bad apple. No. 393 shows the habit of growth of a Screw Pine. Consult the description of 260.

515. **Gardener's Cottage,** hung with Bird Cages and shaded by trees covered with Rattan or Climbing Palms (*Calamus*, sp.). Buitenzorg Botanic Garden, Java.

516. **Banyan Tree** at Passu Gulah, near Diocio, Java. A prisoner was formerly chained to the stone table for

many years and employed his time rolling the two big stones around.

517. **Foliage and Flowers** of *Fagræa auriculata*, Jack, a Forest Tree of Java, with a stray bird (*Megalæma*, sp.).

518. **Wild Banana** (*Musa coccinea*, Roxb.) with the American Aloe (*Agave americana*, L.) in Flower, and Cypress, in a garden, Java.

519. **Group of Wild Flowers** of Java, from Tosari, at an elevation of 6,000 feet, with a young Fern-frond before it is unrolled. The most noteworthy flower in this group is the fine large Forget-me-not in the centre. Two of the plants in front on the left, the *Physalis* and *Datura* (long, purple flower), are common now in nearly all warm countries. The yellowish-flowered *Hydrangea*, in front of the young Fern-fronds indicates some relationship with the vegetation of Japan. Other genera represented are *Impatiens*, *Melastoma?* and *Crotalaria;* and the small blue peaflower hanging in front is *Parochœtus communis*, Hamilt.

520. **Two Swamp Plants**, *Costus speciosus*, Sm., and *Cassia alata*, L., in Flower. Java. The snow-white flowers of the *Costus*, like those of most of its allies, are very fugitive, but the red bracts from which they spring are more durable. *Cassia* is a genus numerous in species, generally diffused in warm countries, and nearly all of them, like the present, have yellow flowers; but *C. nodosa* (302) is a noteworthy exception. Other species are represented in 47 and 277.

521. **Blauwater**, Pasoeroewan, Java. An old Hindoo Tank, whose temple has disappeared; but its sacred monkeys are pensioned and petted by the Dutch Government.

522. **Foliage and Fruit of the Tamarind** (*Tamarindus indica*, L.), and Flowers and Fruit of the Papaw (*Cariaca Papaya*, L.). Java. The Tamarind is a large timber-tree, native of tropical Africa and Australia, and commonly planted for shade; and its pods contain a soft, acid pulp within the brown shell, which is very refreshing preserved in syrup. It is also used medicinally. For a portrait of the tree itself, see 289. The Papaw, a native of tropical America, is now common in most hot countries; the fruit is usually cooked for table, but it is also eaten raw with pepper and salt. It likewise possesses the rare and remarkable property of making fresh meat tender in a few hours. Paintings of the tree may be seen in 50 and 105.

523. **View of the Village of Tosari**, Java, the Ardjuno Volcano seen across the rich Plain. The tall slender trees in the foreground are a species of *Casuarina*.

524. **Flowers and Fruit of the Palmyra Palm** (*Borassus flabelliformis*, L.) and Sketch of the Tree seen through a window. Java. It is recorded that the parts of this Palm are applied to such a number of purposes that a poem in the Tamil language, although enumerating 801 uses, does not exhaust the catalogue. The fruit has a thick coating of fibrous pulp, which is roasted and eaten, or made into a jelly, which somewhat resembles that of the currant. It is noteworthy that the young seedlings of this Palm are used as an article of food. They are cultivated for the markets and either eaten in a fresh state, or after being dried in the sun; and sometimes they are made into a very nutritious kind of meal. The Palmyra is very widely dispersed in tropical Asia and commonly cultivated, growing from sixty to seventy, and occasionally to a hundred, feet high. Unlike the Talipot, the Wine Palm and some others, the Palmyra flowers season after season.

525. **Small Hindoo Temple of Kidel,** Java, with Bananas, Bamboos, and Palms in the background.

526. **Tree Fern** in the Preanger Mountains, Java.

527. **Palmyra Palms in Flood-time.** This Palm commonly grows in low tracts of land that are inundated during the rains. For further information, see description of 524, in which the flowers and fruit are represented.

528. **Flowers of** *Hibiscus Sabdariffa*, L. This is an annual plant commonly cultivated in hot countries. Tarts and jellies are made from the fleshy calyx and capsule, freed from the seeds. A drink prepared from the same parts in the West Indies is called Sorrel-drink, and the plant Red Sorrel. The leaves are used in salads.

529. **Palmyra Palms** (*Borassus flabelliformis*, L.) and Epiphytal Trees in Flood-time, Java. See 524.

530. **A New Caledonian Plant,** *Hibiscus Cooperi.*

531. **View from the Botanic Gardens,** Hobart Town, Tasmania, with Grass-Trees (*Xanthorrhœa*, sp.) and an Oyster Bay Pine (*Frenela rhomboidea*, Endl. var. *tasmanica*) in the foreground.

532. **View over the Blue Mountains** towards the Sea, New South Wales, with Flowers, Seed-vessels, and Young Shoots of *Syncarpia laurifolia*, Tenore, and a Tree of the same beyond on the left, and a Kangaroo Rat in the foreground.

533. **Inflorescence** of *Richea dracophylla*, R. Br., associated with various Berry-bearing Tasmanian Shrubs. The foliage and inflorescence of the *Richea* reminds one rather of the Pine Apple than the beautiful genus *Epacris*, to which, however, it is closely allied. The dark-purple berries are those of *Notelæa ligustrina*

Vent., a shrub of the same Natural Order as the Olive. The berries vary, it is stated, from white to purple into every shade of pink or red. Above on the left, is a spray of the beautiful blue berries of *Billardiera longiflora*, Labill. The clustered white fruit on the right is of *Gaultheria hispida*, R. Br., a common mountain shrub in Tasmania. In this the fleshy part is the calyx, and the pink lines are the inner margins of the lobes. Between the clusters of *Gaultheria* is a branch of *Aristotelia peduncularis*, Hook. f., furnished with rosy cherry-like fruit. The acorn-like bodies above, on the right, appear to be a kind of gall on *Doryphora Sassafras*, Endl.

534. **An Arboreous, Dracæna-like Epacridea** (*Dracophyllum Traversii*, Hook. f.) bearing an old Inflorescence. New Zealand. This remarkable genus is spread over New Zealand, Australia (especially western), and New Caledonia; and the present species, as well as most of the others, has all the appearance of an endogenous plant. The same remark applies to *Richea*, represented in 533.

535. **View of Lake Wakatipe**, New Zealand, with New Zealand Flax (*Phormium tenax*, Forst.) in the foreground. This is the most useful plant in the islands. Half-a-pint of honey juice can be obtained from the flowers of a single plant; a gum is exuded where the leaves are broken away from the stem, which is much used and even eaten by the Maoris; and the dried flower-stalks contain a pith which, when ignited, keeps glowing like tinder, and is carried about by the Maoris as slow matches. On the fresh-cut leaves the Maoris draw and write with a sharp-edged shell; and split or cut into strips they serve as rope or string, which is again plaited into baskets, plates, and dishes, nets and

sails, and woven into garments. About half the leaves are plucked each year without injury to the plants. Although the fibre of the New Zealand Flax is very strong and easily obtained in large quantities, it has hitherto been little used by manufacturers, on account of the difficulty and expense attending the separation of the fibre from the gum resin secreted by the plant. It is one of the commonest and most persistent of plants in the islands, growing equally well from the sea-level up to an altitude of 5,000 feet.

536. **View of the Otira Gorge,** New Zealand. Conspicuous in the vegetation of the foreground are the white plumes of the Toe Toe Reed (*Arundo conspicua,* Forst.), and on the rocks, trees of *Dracophyllum Traversii,* Hook. f. (see 534), and one of *Metrosideros lucida,* Menzies; the latter projects from the rocks across the scene. Quite in front is a plant of the large white-flowered peltate-leaved *Ranunculus Lyallii,* Hook. f., the finest species of the genus, on account of the form of its leaves called Water Lily by New Zealand shepherds. On the rocks behind are some tufts of the "Kid-glove" or "Leather" plant (*Celmisia coriacea,* Hook. f.) so named on account of the white felt that clothes the leaves. The tree at the top on the right with light-green foliage is *Dacrydium Colensoi,* Hook., an ally of the Cypresses of the northern hemisphere.

537. **View in the Forest** on Mount Wellington, Tasmania. The large tree with dark foliage in the centre is a species of Beech (*Fagus Cunninghami*); and the light-green trees, one on each side, are the Celery-topped Pine (*Phyllocladus rhomboidalis,* Rich.) and Sassafras (*Doryphora Sassafras,* Endl.) In front are some Tree Ferns (*Dicksonia antarctica,* Labill.), and *Richea dracophylla,* R. Br.

538. **Illawarra,** New South Wales. Paper-bark Tree (*Melaleuca Leucadendron,* Linn.), and other species of the same genus; and a pink-tipped Spray of *Callistemon salignus,* DC. Compare the latter with the gorgeous *C. speciosus,* 598.

539. **Castle Rock Station,** with Beech Forest, New Zealand.

540. **The Australian Parrot Flower, Sturt's Pea or Glory Pea** (*Clianthus Dampieri,* A. Cunn.). This brilliantly coloured flower, if not very common, has a wide range, occurring in New South Wales, South Australia, and also on the north-west coast. It is noteworthy as being one of the few plants brought home by Dampier on his second voyage nearly 200 years ago, and still preserved at Oxford. A second species, painted on one of the panels of the door opposite, is a native of New Zealand.

541. **Ripe Cone of Cycad** (*Macrozamia spiralis,* Miq.), New South Wales. The beauty of the richly-coloured seeds is only seen after the cones begin to break up.

542. **Foliage and Flowers of the Blue Gum** (*Eucalyptus Globulus,* Labill.) and Diamond Birds (*Plocidæ*). Tasmania. The Blue Gum grows to a large size, occasionally exceeding 300 feet, and is one of the most valuable timber trees of the southern hemisphere; it inhabits Tasmania and Victoria. The very different foliage on the right at the bottom represents the juvenile condition. It is worthy of remark that the Gum Trees, though among the largest trees in the world, have very small or even minute seeds. It has been computed that an ounce of sifted seed of *E. globulus* contains 10,000 fertile grains.

543. **New Zealand Flowers and Fruits.** The spherical plant in the foreground is a small specimen of the

"Vegetable Sheep" (*Raoulia eximia*, Hook. f.) It inhabits the mountains, growing as large and looking so much like a recumbent sheep at a little distance that shepherds have often been drawn to the top of the stony mountains to find only a clump of this *Composita* instead of a stray sheep. Behind the Raoulia are some fronds of the singular fern (*Trichomanes reniforme*, Forst.), which is peculiar to New Zealand. The prickly leaves hanging from the vase are those of the southern Bramble (*Rubus australis*, Forst.,) which bears a yellowish, austere fruit; and the yellow berries are the edible fruit of the Karaka, (*Corynocarpus lævigata*, Forst.), an outlying member of the *Anacardiaceæ*, having large laurel-like leaves. On the left are some hanging spikes of a blue *Veronica*, and another species probably *V. speciosa*, R. Cunn., is represented above on the right, whilst the centre is filled with the clustered crimson flowers of *Metrosideros tomentosa*, A. Cunn., contrasting with the white-flowered *Plagianthus Lyallii*, Hook. f.

544. **Group of Nikau Palm** (*Rhopalostylis sapida*, Wendl. and Drude, syn., *Areca sapida*, Soland.) with a background of the Foliage of Kawa Kawa (*Piper excelsum*, Forst.). New Zealand. The Nikau is the most southern member of the order, and one of the least graceful; it is also the only one indigenous in New Zealand. On the right is one bearing flowers and young fruit.

545. **View of Mount Earnshaw**, 9,000 feet high, from the island in Lake Wakatipe. New Zealand. The trees in the foreground having dense tufts of narrow leaves at the ends of the branches, and large clusters of dirty-white flowers, belong to the Liliaceous genus *Cordyline*. They are called cabbage-trees by the Colo-

nists, and a durable fibre is obtained from their leaves, but it is not so tough as that of *Phormium.* On the right is a plant of the curious *Panax longissimum,* with long deflexed leaves. The tufted plants in the foreground, one of which has a flower-stem, belong to the Umbelliferous genus *Aciphylla,* of which there are several species. They are called "Spear-grass" and "Wild Spaniard," as their hard, sharp pointed leaves form thickets impenetrable to man and beast.

546. **Fishbone Tree** (*Panax crassifolium,* Dcne. & Planch.), and the Parson Bird (*Prosthemadera Novæ-zealandiæ*). The plant on the left, having long, deflexed, coarsely-toothed leaves, giving it the appearance of a wrecked umbrella, is the juvenile condition, which was formerly supposed to be a distinct species, and described under the name of *P. longissimum.* As may be seen, the flowering branches bear leaves having three or five radiating leaflets. As great, though not so marked, a difference exists between the leaves of the young or sterile branches and those of the flowering branches of the common Ivy, a member of the same Natural Order.

547. **Blue Gum Trees** (*Eucalyptus Globulus,* Liabill.), both living and dead, associated with Silver Wattle (*Acacia dealbata,* Link), and Sassafras (*Doryphora Sassafras,* Endl.), on the Huon Road, Tasmania.

548. **Flowers and Foliage of the Silver Wattle** (*Acacia dealbata,* Link). Queensland. This tree yields an excellent gum, and when in flower it scents the whole country with its sweetness. Behind is the farm of Greenlands; and on the left a Eucalyptus tree hung with parasites, with a long train of sheep raising a cloud of dust.

549. **View at Illawarra,** New South Wales, with Palms (*Livistona australis,* Mart.) in the foreground.

fork of a Gum Tree for its sleeping-place during the day; and it feeds on the leaves and young shoots of the Gum Tree at night. Like the Kangaroo it is a Marsupial or pouched mammal, and when its young are old enough it takes them out of its pouch and carries them on its back. It is quite arboreal in its habits, and the division of its five claws into two groups enables it to grasp the branches in such a way that it can go head-downwards as well as upwards. The painting was done from a young pet in Victoria.

558. **The Bottle Tree** (*Sterculia rupestris*, Benth., syn. *Delabechea rupestris*, Lindl.) of Queensland, with its oddly-shaped leaves and seed-vessels in front. Beyond, a grass fire, through which the artist and her companions had to gallop.

559. **Gum Trees** (*Eucalyptus* spp.), Grass-trees (*Xanthorrhœa* spp.), and Wattles (*Acacia* sp.) in flower, in a Queensland forest.

560. **View in the Brisbane Botanic Garden**, with Moreton Bay Pine (*Araucaria Cunninghami*, Ait.) in the foreground, and an American *Tacsonia* in front.

561. **Flowers and Seed-vessels of the Port Jackson Wooden Pear** (*Xylomelum pyriforme*, Knight), New South Wales. Like the fruits or seed-vessels of so many Australian shrubs and trees, the Wooden Pear is very hard and woody. Each fruit contains only two seeds, and these are furnished with a light, delicate wing whereby the wind often bears them a long distance.

562. **West Australian Flowers.** The "Kangaroo Feet" (*Anigozanthus*), of which five species are depicted, are peculiar to West Australia, and are remarkable for the uncommon hues of their very hairy flowers. *A.*

Manglesii, Don, the tall one behind, with green and crimson flowers, is one of the most striking. Quite behind is a tuft of the Smoke Plant (*Conospermum triplinervium*, R. Br.), which often fills the damp hollows, presenting the appearance of a real mist hovering over the ground. The foreground is carpeted with a creeping plant of two varieties, white and red. See 598.

563. **Scene in a West Australian Forest.** Large trees of the Black Butt and Red Gum (*Eucalyptus* spp.), with undergrowth of Grass - trees (*Xanthorrhœa*), *Banksia*, *Kingia*, *Macrozamia Fraseri*, Miq., &c. The Grass trees are commonly called Black Boys, a human specimen of which is placed by the side of one to show the likeness. In the left foreground are some very fine old examples of the *Kingia australis*, R. Br.

564. **Wild Flowers of Victoria and New South Wales.** At the back, two or three species of *Stylidium*, a large and curious genus almost entirely Australian, upwards of eighty species being known. They are remarkable for the great irritability to touch exhibited by the central organ (column) of the flower. On the right is a yellow and purple orchid (*Diuris* sp.). The yellow-flowered *Composita* with a dark centre is the Cape Weed (*Cryptostemma calendulacea*, R. Br.), which in a few years has covered every meadow in Victoria; and the hanging *Papilionacea* is *Platylobium triangulare*, R. Br. *Epacris longiflora*, Cav., lies in the foreground, with a species of *Grevillea* on the right.

565. **Brisbane Botanic Garden**: Palms in the foreground and avenue of Araucarias behind. The two tall Palms are a species of *Ptychosperma*; the dwarf one behind, *Areca Northiana*, Hill; with *Kentia minor*, F. Muell., on the right.

566. **West Australian Plants:** *Cephalotus follicularis,* Labill., and various species of Sundew (*Drosera*) in the foreground, with *Conostylis* sp. (clustered yellow flowers), *Bulbine* sp.? (racemose yellow flowers), and a blue-flowered *Lobelia,* behind on the left; and *Cheiranthera filifolia,* Turcz., hanging above on the right. The most remarkable plant in this group is the pitcher-bearing *Cephalotus,* which is only found in West Australia. It has no affinity to the climbing Pitcher Plants (*Nepenthes*), but is closely allied to the northern genus *Saxifraga.*

567 **Evening Glow over "The Range,"** seen through Red Gums at Harlaston, Queensland.

568. **Foliage of** *Eucalyptus amygdalina,* Labill., and Flowers of *Tecoma australis,* R. Br., with Flying Opossums (*Belideus flaviventris*). Aided by the membrane between their legs, these little creatures have been known to leap forty yards from an elevation of thirty feet on one side of a river to the foot of a tree on the other side.

569. **Tree Ferns in Victoria,** with a nest of the Lyre Bird (*Menura superba*), standing a yard above the ground amongst the old fern fronds, with a perch in front for the parents to rest on and feed their one offspring till it gets so big that it entirely fills the nest and is supposed to be strong enough to forage for itself and protect its elegant but inconvenient tail from injury.

570. **"Possum up a Gum Tree,"** eating the leaves of *Eucalyptus paniculata,* Sm., and *Loranthus aurantiacus* A. Cunn., which is parasitic on the former, and closely mimics it in its foliage. The pretty little animal was pulled out of a hole in a tree, and a few hours afterwards he had become so tame that he took milk out of a teaspoon.

571. **Two Australian Shrubs,** *Callistemon lanceolatus,* DC.? and *Tecoma australis,* R. Br., with Sydney Harbour below.

572. **Wild Flowers of Albany,** West Australia. In the foreground, among others, are: *Anthocercis viscosa,* R. Br., the large white flower; *Thysanotus* sp., purple flowers with fringed petals; *Leschenaultia biloba,* Lindl.. deep blue flowers; behind, *Bartonia conferta,* DC. Hanging in front of the vase, *Kennedya coccinea,* Vent., with the elegant blue *Sollya heterophylla,* Lindl. on the right; and the white and pale pink inflorescence above, somewhat like a Maltese cross, is the umbelliferous *Xanthosia rotundifolia,* D.C., intermixed with *Pimelea rosea,* R. Br. Above these, a species of *Petrophila,* and the pink, hop-like inflorescence of the liliaceous *Johnsonia lupulina,* R. Br. Behind and to the right several species of *Stylidium,* with the dark purple brown *Tetratheca filiformis,* Benth., in front.

573. **Foliage, Flowers, and Seed-vessels** of the rare West Australian *Eucalyptus macrocarpa,* Hook., with a portrait of one of the few remaining specimens of this species near Newcastle. Although this has the largest flowers of the 140 or more species of the genus, succeeded by the largest seed-vessels, or fruit, it is only a shrub from six to ten feet high, and has been nearly extirpated by sheep in the districts where it is known to grow. The bud, with the cap or calyptrum falling away, shows well one of the essential characters of the genus, and that which suggested the generic name. This cap consists, it is assumed, of the petals grown together. In the background are some Raspberry-jam trees (*Acacia* sp.), so called from the sweet scent of their valuable wood. On receiving a telegram that the Eucalyptus was in flower, the artist rode out sixty miles in one day to paint it, and returned the next day.

574. **View near Brighton, Victoria,** looking through a hedge of Tea Shrub (*Leptospermum* spp.) with a caterpillar's nest of the leaves above on the left. The small-leaved species on the right is probably *L. scoparium*, Forst., and the other *L. lævigatum*, F. Muell. The early colonists used the leaves of these shrubs as a substitute for tea.

575. **Various species of** *Acacia* and other shrubs, growing in the shore sand at Freemantle, West Australia, with branch of *Acacia cyclopis*, A. Cunn., bearing flowers and pods in front. Observe the brilliantly-coloured funicle encircling the seeds.

576. **View of Melbourne,** Australia, from the Botanic Gardens, with Cordylines in flower in the background.

577. **West Australian Sand-loving Plants.** The soil in this district is so very sandy that, with the exception of a few big stones, the whole country might be run through an hour-glass. In the foreground are the feathery ball-like inflorescences of *Trichinium Manglesii*, Lindl., associated with a richly-coloured *Grevillea;* above, on the right, foliage and flowers of *Grevillea bipinnatifida*, R. Br.; to the left of the centre a plant of *Isotoma Browni*, G. Don, a member of the *Lobeliaceæ* regarded as poisonous to sheep; the blue-flowered *Byblis gigantea*, Lindl., one of the Sundew order; and the elegant everlasting *Helipterum Manglesii*, F. Muell. better known by the name *Rhodanthe Manglesii*, Lindl. The singular reptile in the background is called the "Devil."

578. **Forest Scene in West Australia,** with a foreground of Grass Tree (*Xanthorrhæa*); on the right *Kingia* sp., probably distinct from *K. australis*, in the

middle; and a Cycad (probably *Macrozamia Fraseri*, Miq.) on the left, with a species of *Banksia* just behind.

579. **West Australian Vegetation.** The shrub in front, having the leaves crowded at intervals along the branches, and thread-like racemes of small flowers, is *Leucopogon verticillatus*, R. Br., with the massive foliage and seed-vessels of *Eucalyptus calophylla*, R. Br., behind; and the slender *Agonis flexuosa*, Schauer, with small flowers in clusters along the branches, hangs on the right.

580. **Fernshaw, Victoria.** The white Gum tree in the middle distance was measured by Baron Mueller, and found to be 365 feet high; the Tree Fern in the foreground was forty feet high.

581. **Wild Flowers of the Blue Mountains**, New South Wales. Conspicuous in this selection is the star-like white inflorescence of *Actinotus Helianthi*, Labill., an umbelliferous plant simulating a *Composita.* Lying in the left foreground are the dark blue flowers of a *Patersonia;* and on the right, rosy flowers of a pinnate-leaved *Boronia.* Other genera represented are: *Pimelea, Diuris, Eriostemon, Epacris, Correa, Kennedya, Daviesia, Helichrysum, Lambertia, Styphelia,* and *Tetratheca.*

582. **White Gum Trees and Palms**, Illawarra, New South Wales. The lofty pinnate-leaved Palm is *Ptychosperma Cunninghamii*, Wendl., better known in gardens in this country under the name *Seaforthia elegans.* One of these has its crown far away up in the tall Gum tree, and its very slender stem is probably not less than 150 feet high. In the left foreground is a group of the handsome fan-leaved *Livistona australis*, Mart.

583. **Musk Tree** (*Olearia argophylla*, F. Muell., syn. *Eurybia argophylla*, Cass.), and background of Ever-

green Beech—Myrtle Tree of colonists (*Fagus Cunninghamii*, Hook.). Victoria. The Musk Tree is an arboreous *Composita*, whose ample foliage forms a striking feature in the vegetation of some parts of New South Wales, Victoria, and Tasmania. Of all our forest trees, the only genus represented in the Southern Hemisphere is Beech or *Fagus* ; but the Southern species differ very much in aspect, from the Northern ones, having small, usually evergreen leaves ; hence the early colonists did not recognise their relationship, and gave them various fancy names. There are beeches in South-east Australia, Tasmania, New Zealand, and Fuegia. *F. Cunninghamii* is a large forest tree attaining a height of 200 feet, and a girth of forty feet in the trunk.

584. **Yarrah, or Mahogany** (*Eucalyptus marginata*, Sm.) ; the handsome red-flowered *Grevillea Banksii*, R. Br. ; and Cockatoo (*Cacatua* sp.), West Australia.

585. **View**, looking out of the Bunya forest at the summit, the tops of some Bunyas (*Araucaria Bidwillii*, Hook.) to be seen in the middle distance, on the right.

586. **Study of the Flame-tree or Fire-tree** (*Nuytsia floribunda*, R. Br.), associated with various species of *Banksia* and *Hakea*, and Grass Trees (*Xanthorrhœa*) on the right, looking over the Swan River valley towards the sea. West Australia. This is a very remarkable tree in many respects. It belongs to the same Natural Order as the Mistleto, an Order numerous in species; most of those inhabiting warm countries having brilliantly-coloured flowers, and all of them, excepting this and *Atkinsonia ligustrina*, F. Muell,, a native of the Blue Mountains in New South Wales, strictly parasitical on the branches of other trees. Although *Nuytsia floribunda* is terrestrial, and has all the aspect of an inde-

pendent tree, it is supposed that it may be parasitical on the roots of some other tree or shrub, because all attempts to rear seedlings have been unsuccessful. Its trunk is soft like pith, yet it has a massive appearance. Its gorgeous flowers are more brilliant than flames, for they are undimmed by smoke. They are painted natural size in 588.

587. **Sandal Wood** (*Fusanus spicatus*, R. Br.) and Opossum Mouse. West Australia.

The Opossum Mouse is the smallest of all the marsupials, It is an herbivorous animal, living in tree-ferns, and of nocturnal habits. Its prehensile tail is in constant use. At the present time (1882) the artist has three alive in London. They are most gentle, and when placed in the hand they become quite flat like bats. The original *Antechinus flavipes*, as the name indicates, had yellow feet, but this has pink feet.

588. **Flowers of the Flame-tree,** (*Nuytsia floribunda*, R. Br. (see description of 586), and the remarkable black and yellow *Kennedya nigricans*, Lindl., a Papilionaceous climber, with trees of *Nuytsia* in the distance. West Australia.

589. **Study of the Bunya-Bunya** (*Araucaria Bidwillii*, Hook.). This noble Conifer is perhaps the most valuable food-tree indigenous in Australia, and only grows on one semicircle of hills, within 100 miles in stretch, between the Brisbane and Burnett rivers, Queensland. The larger of the older trees are nearly 200 feet high, with a circumference of trunk of about twenty-five feet; and the horizontal markings on the pillar-like trunks make them very conspicuous amongst other trees. But what is most remarkable about these trees is that they are the only hereditary property any of the aborigines

are known to possess. Each tribe has its own group of trees, and each family a certain tree or trees; and any interference with these rights leads to a bloody fight. The larger cones are a foot long and nine inches in diameter; and they are full of edible nuts (seeds) as large as chestnuts. Every third year there is an extra large crop, when the natives assemble from all parts to collect it. By an act of the Colonial Government the Bunya-Bunya is strictly preserved for the use and sustenance of the aborigines. Look at 535, 593, 595.

590. **Our Camp on the Bunya Mountains,** Queensland.

591. **White Gum and Stringy-bark Trees** (*Eucalyptus* spp.). The bark of the latter (*Eucalyptus obliqua*, Lher.) comes off in large slabs, and is used in making wigwams and roofs; and the natives also use it when they wish to cross a river, They strip off a large concave piece and stop up the ends with mud, so as to keep the water out; thus forming a rude canoe in which they paddle themselves over with a piece of wood, leaving it to rot or float away.

592. **View from Collaroy,** New South Wales, looking towards the Liverpool Downs; the plain dotted with Gum trees and the river bordered with Casuarinas, with blue and crimson Parrots (*Aprosmictus erythropterus*) in the branches of the Peppermint (*Eucalyptus* sp.—*E. piperita*, Sm. ?) in front.

593. **Nest** of the *Psophodes crepitans*, called the Coachman's Whip Bird, in a tree of the Bunya-Bunya (*Araucaria Bidwillii*, Hook.). The trees were full of these hanging nests, made of the freshest green moss, and ornamented with the feathers of the common red and blue parrots. Queensland.

594. **Flowers and Fruiting Cones,** in various stages of development, of *Banksia coccinea,* R. Br.; and flowers of a climbing Papilionacea (*Gompholobium polymorphum,* R. Br.), with a distant view of King George's Sound, West Australia.

595. **View of the Old Bunya-Bunya** (*Araucaria Bidwillii,* Hook.) forest in Queensland, and Kangaroos in the foreground. The tall trees having slender spreading branches, leafy only at the tips, are the Bunya-Bunya. See description of 589.

The Kangaroos belong to a family of mammals peculiar to Australasia and America. They bring forth their young before they are fully developed; and for some time after their birth the young are carried by the mother in a pouch beneath the abdomen, where they are attached to the teats. There are many different species of Kangaroo in Australia. They move by jumps, on their hind feet, and can travel very fast.

596. **A Natural Fernery,** a grove of Tree Ferns in Victoria.

597. **Flower-spikes** of *Banksia attenuata,* R. Br., in various stages of development. The narrow grey spike in front is the youngest, having in this condition the appearance and texture of wool-work; above, in an oblique position, is one a little further advanced, and just below this is one with the flowers fully expanded. In the lower corner is an old spike bearing a few seed-vessels, from which it may be seen that only a very small number of the numerous flowers are fertile. *B. attenuata* is a tree of about forty feet high, restricted to West Australia.

598. **Flowers** of *Callistemon speciosus,* D. C., and Kangaroo Feet (*Anigozanthus flavida,* Red.). Western

Australia. The genus *Callistemon* comprises about ten species scattered nearly all over Australia; but *C. speciosus* is the finest. It inhabits King George's Sound and the neighbouring districts. On the left side of the picture is a branch bearing seed-vessels. See 562.

599. **Trees near Fernshaw,** Victoria. The tall trees are *Eucalyptus amygdalina,* Labill., most of them more than 300 feet high. Several trees of this species that have been measured were more than 400 feet high; and the tallest measured was 471 feet. In the foreground is an evergreen Beech (*Fagus Cunninghamii*) and Tree Ferns (*Dicksonia antarctica*).

600. **Australian Spear Lily** (*Doryanthes Palmeri,* Hill) and *Acacia armata,* R. Br. There are two species of *Doryanthes,* the present, and *D. excelsa,* which has a globose inflorescence. They both inhabit Eastern Australia. See 627 in the gallery above.

601. **An old Currajong Tree** (*Hibiscus heterophyllus,* Vent.). The aborigines make their fishing-lines from the bark, and the soft, spongy trunks are formed into canoes.

602. **Branch of a species of** *Grevillea* (*G. leucopteris,* Meissn.?), bearing both flowers and seed-vessels, with a bush of the same, and a Red Gum tree behind, hung with a kind of Mistletoe (*Loranthus* sp.); beyond, a view of Swan River, West Australia.

603. **The central figure** of this picture represents the skeleton-like trunk of a Fig Tree, which has nearly strangled the Poison Tree (*Laportea moroides,* Wedd.), in a fork of whose branches it started life as a seedling epiphyte. It soon grew apace, and sent down many roots to the earth, where they obtained food and grew in size, enclosing and crushing the trunk of the nurse-

tree. Behind are some large pillar-like trunks of *Araucaria Bidwillii*, Hook., whilst the graceful Seaforthia (*Ptychosperma Cunninghamiana*, Wendl.), Tree Ferns and *Callitris* share the foreground. Under the *Callitris* is a nest of the Bush Turkey.

604. **Karri Gums** (*Eucalyptus diversicolor*, F. Muell.), near the Warren River, West Australia, with Casuarinas and Emus in the foreground. The Karri Gum trees are among the tallest trees in the world. Baron Mueller states that he has seen many of them that approached 400 feet in height. One of those painted has a monstrous ring of warts around the trunk, reminding one of the columns of Milan Cathedral, the trunks being as white and polished as the pillars themselves. See 599.

605. **Flowers of the Large Water Lily** (*Nymphæa gigantea*, Hook.), with Screw Pines (*Pandanus* sp.) and a species of *Aralia* in the background. Botanic Gardens, Queensland. This Water Lily is peculiar to Australia.

606. **Foliage and Flowers of** ***Banksia grandis***, Willd. with a blue-flowered species of *Comesperma* (perhaps *C. volubile*, Labill.) climbing over it. West Australia. This is one of the noblest of the genus *Banksia*, which numbers nearly fifty species—all Australian, and chiefly Western.

607. **Flowers of the Waratah** (*Telopea speciosissima*, R. Br.), the most gorgeous of all the Australian *Proteaceæ*. It is a shrub from six to eight feet high. A plant is seen in the background, and the yellow flowers of an Acacia above it. Blue Mountains, New South Wales.

608. **Gum Trees** (*Eucalyptus amygdalina*, Labill.), and Tree Ferns, Victoria. This is the loftiest of the numerous kinds of Gum trees. See 599.

609. **A Bush Fire at Sunset.** Queensland. Vast areas of country are devastated by periodical fires.

610. **Fig-tree Village** and its Big Godfather, Illawarra, N. S. Wales.

611. **Flowers and Seed-Vessels** of *Eucalyptus ficifolia*, F. Muell., with Honeysuckers and their nest. West Australia. This is perhaps the most beautiful of all the Gum Trees. It is a small tree, nearly allied to *E. calophylla*, R. Br. (see 579), but the latter has white flowers.

612. **Foliage, Flowers, and Fruit** of a Proteacea (*Macadamia ternifolia*, F. Muell.), and Black Cockatoo (*Calyptorhynchus Banksii*). Queensland. This bird alone has a beak strong enough to crack the nuts of the Macadamia.

613. **Various species of Hakea**; a flower-bearing branch of *Eucalyptus tetraptera*, Turcz., at the top on the right; and a purple-flowered Malvacea (*Hibiscus Huegelii ?*). West Australia. The genus *Hakea* is peculiar to Australia, and comprises nearly one hundred species, spread over the whole country, but most numerous in the west. That on the left, having conch-like leaves, is *H. cucullata*, R. Br.; and that on the right, with flat spatulate leaves and remarkably curved seed-vessels, is *H. cyclocarpa*, Lindl.

614. **White Gum Trees and Casuarina,** in the centre, at the Mudgee ferry, with Platypus (*Ornithorhynchus paradoxus*) in the water and Native Bear (*Phascolarctos cinereus*) in a fork of the Gum Tree on the left.

615. **Foliage, Flowers, and Seed-vessel of the Opium Poppy** (*Papaver somniferum*, L.). This plant has been cultivated in Eastern countries from the most remote time for the sake of the dried juice, called opium; and

it is still very largely grown in Asia Minor, Persia, and India. Enormous quantities are sent from the last-named country to China, where the baneful habit of opium-smoking is very prevalent. Morphia is an alkaloid that is extracted from opium, and it is one of the most valuable drugs known. It is administered in various forms or combinations.

The twelve large pictures in the recesses between the windows were painted from plants cultivated in this country. Except where otherwise stated, they are represented natural size.

616. **Abyssinian Aloe** (*Aloe abyssinica*, Lam.). This plant was discovered by the celebrated traveller Bruce, who sent seeds of it to Paris about the year 1777, and it seems to have been in cultivation ever since. The genus *Aloe* is spread all over Africa, and the species are especially numerous in the south. One species is common in India. See 20 and 35.

617. **A South African Plant** (*Strelitzia Reginæ*, Ait.). a member of the same Natural Order as the Banana, introduced into English gardens in 1773 by Sir Joseph Banks. There are several other species, all natives of South Africa.

618. **A climbing Plant of Old Calabar** (*Aristolochia Goldieana*, Hook. f.). One of the most singular of the many species of its genus, having the largest flowers of any yet known. It is a native of western tropical Africa, and living plants or seeds of it were sent to this country about the year 1866 by the Rev. W. C. Thomson, at whose request it was named in memory of his fellow-labourer, the Rev. Hugh Goldie. The genus *Aristolochia* is represented in all tropical and most temperate regions. See 46.

619. **A Brazilian Columnar Cactus** (*Cereus cærulescens*, Salm.). Upwards of a thousand species of *Cactaceæ* are known, all of them inhabiting America, and ranging from Chili and Buenos Ayres in the south to about 50° N. lat., their greatest concentration being in Mexico. They vary in stature from an inch or two, as in some species of *Mamillaria*, to sixty feet, as in *Cereus giganteus* (see 199). The present species flowered at Kew, for the first time in Europe, in 1842. With the exception of one or two species of *Rhipsalis*, which have not the habit of the ordinary cactus-type, all the *Cactacæ* found wild in the Old World are believed to have descended from plants introduced from America. In some parts of South Africa, where they find a congenial climate, they are spreading very rapidly, and are likely to become a nuisance to farmers.

620. **A New Granadian Aroid** (*Anthurium Andræanum*, Linden). After a long reign, the brilliant *Anthurium Scherzerianum* has now to compete with its still more beautiful ally, here represented. It appears to have been first discovered by Dr. José Triana, a native of New Granada; but to Mr. E. André, after whom it is named, belongs the honour of having brought the first living plants to Europe, in 1877.

On the panels of the door are paintings of the purple *Cobœa scandens*, Cav., a native of Mexico; and *Tacsonia mollissima*, H.B.K., from the Andes of South America.

621. **Adam's Needle or Yucca** (*Yucca gloriosa*, L.), about half natural size. A very old inhabitant of English gardens, having been cultivated during the latter half of the sixteenth century by Gerard and Parkinson. It is a native of the south-eastern States of North America.

622. **A Garden Variety of Indian Shot** (*Canna Ehemannii*, Hort.). This is a hybrid between the tropical American *C. iridiflora* and another species.

623. **An Orchid of Tropical Asia** (*Vanda suavis*, Lindl.). This handsome orchid has been cultivated in England since 1848. The allied *V. tricolor*, Hook. differs chiefly in the colour of the flowers.

624. **A Japanese Lily** (*Lilium auratum*, Lindl.). This is said to be one of the commonest wild flowers in some parts of Japan. Yet, in spite of its beauty, it was not introduced alive in this country till the year 1861. The late John Gould Veitch had the good fortune to introduce it. True lilies are found all round the north temperate zone.

625. **A Japanese Magnolia** (*Magnolia obovata*, Thunb., syn. *M. purpurea*, Curt.). This showy spring-flowering, hardy shrub has been cultivated in English gardens ever since 1796, and is recorded as having first flowered in the collection of the Duke of Portland.

626. **A New Zealand Tree Fern** (*Cyathea medullaris*, Swartz.) A reduced representation of a fine specimen growing in the Winter Garden hard by. It is the Black Fern of the colonists; and, in its native country, it forms a stout trunk from twelve to forty feet high.

627. **Australian Spear Lily** (*Doryanthes Palmeri*, Hill). About one quarter natural size, painted from a plant that flowered in these gardens in the spring of 1882. See 600.

CATALOGUE OF THE WOODS

FORMING THE

Panelled Wainscot below the Pictures.[*]

1. **Thuja-wood** (*Callitris quadrivalvis,* Vent.). North Africa. This hard fragrant wood is very durable, and it is extensively used in the construction of mosques and other buildings. It is also used in turnery. 603.

2. **Lemon** (*Citrus limonum,* Risso). A native of tropical Asia, cultivated in many other countries. A small tree.

3. **Olive** (*Olea europæa,* L.). Mediterranean region. The olive is usually a small, tortuously branched tree, though occasionally the short trunk attains a great size; and the wood is employed in making wheels and other articles in which hardness and durability are essential. Picture 3.

4. **Turkey Oak** (*Quercus cerris,* L.). South and Central Europe and Asia Minor. A handsome tree of more rapid growth than the common Oak. There are some fine examples of it in these Gardens.

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[*] It has been impossible to determine the names of a considerable number of the woods, including all of the Bornean. The numbers at the end of the descriptions are those of the pictures in which the trees or parts of them are represented.

5. **Common Walnut** (*Juglans regia*, L.). Europe and Asia, though perhaps introduced into the former country. Furniture and gun-stocks are the most familiar uses of this wood.

6. **Fig** (*Ficus Carica*, L.). Western Asia. A specimen of this soft wood is more a curiosity than anything else.

7. **Holm or Evergreen Oak** *Quercus Ilex*, L.). Mediterranean region and eastward to Afghanistan. A medium size tree, of which there are some old specimens growing near this gallery.

8. **White Mulberry** (*Morus alba*, L.). China, and naturalized in other countries. Of no importance as a timber tree.

9. **Levant Pine** (*Pinus halepensis*, Mill.). South Europe and Asia Minor.

10. **Common Ash** (*Fraxinus excelsa*, L.). Europe and Western Asia. This very tough wood is largely employed by wheelwrights and coopers.

11. **Cedar Lebanon** (*Cedrus libani*, Loud.). Mount Lebanon, Syria and Asia Minor.

12. **Common Yew** (*Taxus baccata*, L.). North temperature zone.

13. **Olive** (*Olea europæa*, L.). Mediterranean region.

14. **Cedar of Lebanon** (*Cedrus libani*, Loud.). Mount Lebanon, Syria and Asia Minor. There are three very closely allied species or forms of true Cedar, namely, the Atlas, the Deodar, and the present one. They

all produce good timber in their native countries, but the wood of the Cedar of Labanon and the Atlas Cedar grown in this country is comparatively soft and spongy.

15. **Letterwood** (*Brosimum Aubletii*, Pœpp. & Endl.). Peru, Guiana, and Brazil. A very fine specimen of this beautiful wood, which is also called Snake-wood and Leopard-wood in allusion to the markings. It is only the heart-wood, that is thus high-coloured and elegantly marked; and this can only be had in narrow strips. This tree is a member of the *Artocarpeæ*, or Bread Fruit order, and another species of the genus, *B. Galactodendron*, is the famous Cow-tree of South America, which yields a milk said to be of as good a quality as cows' milk.

16. **Yacca** (*Podocarpus coriaceus*, Rich. syn. *P. Yacca*, Don.). West Indies. A moderate size tree inhabiting the mountains of Jamaica, Trinidad, etc.

17. **Purple Heart** (*Copaifera pubiflora*, Benth.). Guiana and Brazil. A member of the *Leguminosæ*, and one of the numerous hard, durable woods in which Guiana abounds.

18. **Locust Wood** (*Hymenæa Courbaril*, L.?). Tropical America. Also one of the *Leguminosæ* if correctly identified.

19. **Tulip Wood** (*Physocalymma floridum*, Pohl.). Brazil. A handsome specimen of this wood, which is much used for inlaying costly furniture, for turnery, etc. This tree is a member of the *Lythraceæ*.

20. **Zebra Wood** (*Omphalobium Lamberti*, DC.?). Guiana.

21. **Purple Heart** (*Copaifera pubiflora*, Benth.). Guiana and Brazil.

22. **Locust Wood** (*Hymenæa Courbaril*, L.?). Tropical America.

23. Unknown. Guiana.

24. **Rosewood** (*Jacaranda braziliana*, Pers.). Brazil. One of several kinds of wood called Rosewood by furniture and cabinet makers. This is a member of the *Bignoniaceæ.*

25. **Jamaica Satinwood** (*Amyris balsamifera*, L.). West Indies. This is one of the woods sometimes called *lignum rhodium.*

26. **West Indian Cedar** (*Cedrela odorata*, L.), West Indies. *Cedrela* is a meliaceous genus represented by valuable arboreous species in America, India, and Australia. They should not be confounded with the true Cedars, which are cone-bearing trees, inhabiting temperate regions.

27. **Locust Wood** (*Hymenæa Courbaril*, L. ?). Guiana.

28, 29, 30. Unnamed.

31. **Bull-wood**, Bahamas. We have not been able to determine the botanical affinity of this wood.

32. **Purple Heart** (*Copaifera pubiflora*, Benth.). Guiana and Brazil.

33, 34, and 35. **Guiana Wood.** Undetermined.

36. **Pencil Cedar** (*Juniperus bermudiana*, L.). Bermudas. It is noteworthy that this, the only forest tree in the remote cluster of islets known as the Bermudas, has been preserved by the inhabitants during the period of nearly three centuries that they have been settled.

The familiar Red Cedar (*J. virginiana*, L.) is closely related to it.

37. **Purple Heart** (*Copaifera pubiflora*, Benth.), Guiana and Brazil.

38. "**Chossie Cherry.**" United States.

39. **Ash Burr** (*Fraxinus americana*, L.). Eastern North America. The White Ash of the Americans and a large Forest tree.

40. **Curled Ash** (*Fraxinus*, sp.). United States.

41. **Whitewood** (*Liriodendron tulipifera*, L.). Eastern North America. This is the Tulip Tree, of which there are large examples in these Gardens. 213.

42. **Black Cherry** (*Prunus serotina*, Ehrh.). Eastern North America. A large tree, furnishing a valuable wood for the cabinet maker.

43. **Plain Grey Walnut or Butternut** (*Juglans cinerea*, L.). Eastern North America. A tree thirty to fifty feet high.

44. **Figured Birch** (*Betula lenta*, L.). Eastern North America. This tree, which is rather large, bears the names Cherry Birch, Sweet Birch, and Black Birch, and it yields a valuable timber.

45. **Bird's-eye Sugar Maple** (*Acer saccharinum*, Wang.). Eastern North America. A large and very handsome tree, sometimes called Rock Maple.

46. **North American Satinwood** (*Zanthoxylum floridum*, Nutt.). A small tree only found in Florida.

47. **Californian Dogwood** (*Cornus Nuttallii*, Audb.), Western North America, from Monterey northward, to the

Fraser River. A small tree, though it occasionally attains a height of seventy feet. Wood very hard. See picture 204.

48. **Black Cherry** (*Prunus serotina*, Ehrh.). Eastern North America.

49. **Figured Pitch Pine** (*Pinus rigida*, Mill.). Eastern North America, from Maine and New York southward. One of the commoner species, thirty to seventy feet high.

50. **Maple Veneer** (*Acer rubrum*, L. ?). North America.

51. **Black Walnut** (*Juglans nigra*, L.). North America, chiefly in the Central States. A large handsome tree, very different in habit of growth from the common Walnut. There are some middling size specimens in these Gardens.

52. **Bird's-eye Sugar Maple** (*Acer saccharinum*, Wang.). Eastern North America.

53. **Plain Maple** (*Acer macrophyllum*, Pursh.).. Western North America, from Santa Barbara, in California, to the Fraser River, in British Columbia. Tree fifty to ninety feet high. The white hard wood takes a good polish.

54. **Plain Grey Walnut or Butternut** (*Juglans cinerea*, L.). Eastern North America.

55. **Curled Ash** (*Fraxinus* sp.). Eastern North America.

56. **Laurel Burr.** Eastern North America. We have not been able to determine the botanical name of this wood.

57. **Figured Black Walnut** (*Juglans nigra*, L.). Eastern North America. See panel 51.

58. **White Oak** (*Quercus alba*, L.). Eastern North America. A large tree yielding a valuable timber.

59. **Figured Maple** (*Acer macrophyllum*, Pursh.). Western North America. See panel 53.

60. **Yellow Birch** (*Betula lutea*, Michx. f.). Eastern North America, New England to Lake Superior and northward. Sometimes called Gray Birch. Wood said to be whiter and less valuable than that of the Cherry Birch.

61. **Douglas Fir** (*Pseudotsuga Douglasii*, Carr., syn. *Abies Douglasii*, Lindl.). Western North America, throughout the coast ranges and in the Sierra Nevada, up to 6,000 or 8,000 feet, and also northward near the coast, attaining its largest size in Oregon. This is one of the handsomest of coniferous trees, growing from 200 to more than 300 feet high, with a trunk eight to fifteen feet in diameter. The flagstaff on the mound close by is of this species. Painting 210.

62. Unknown. Eastern North America.

63. **Red Cedar** (*Juniperus virginiana*, L.). North America, from Florida to Hudson's Bay, varying according to latitude from a bush to a tree ninety feet high.

64. **Yellow Cypress** (*Cupressus nutkaensis*, Hook.). Columbia River to Alaska. Commonly cultivated in this country under the name of *Thuyopsis borealis*.

65. **Manzanita** (*Arctostaphylos pungens*, H.B.K.). Western North America, from Oregon southward into the mountains of Mexico. A shrub ranging from a few

inches at alpine elevations to eight or ten feet in the most favourable localities. The short trunk rarely exceeds a foot in diameter.

66. **Yellow Pine** (*Pinus ponderosa*, Dougl.) Western North America, from California to Oregon and northward. One of the taller pines, reaching 200 to 300 feet in height, with a trunk twelve to fifteen feet in diameter. Painting 209.

67. **Black Walnut Burr** (*Juglans nigra*, L.). Eastern North America.

68. **Redwood** (*Sequoia sempervirens*, Endl.). Western North America. For particulars of this gigantic tree consult the description of the picture 218.

69. **Live Oak** (*Quercus chrysolepis*, Liebm.). California. This is described as one of the more conspicuous and beautiful oaks of the Coast Ranges and the Sierra Nevada, throughout the length of the State. The trunk is frequently three to five feet in diameter, and one has been found twenty-eight feet in circumference.

70. **Redwood** (*Sequoia sempervirens*, Endl.). Western North America. 218.

71. **Mountain Laurel** (*Umbellularia californica*, Nutt. syn. *Oreodaphne californica*, Nees). Western North America. A handsome shrub or tree, ranging from San Diego in California to Douglas County, Oregon. In the more southern localities it rarely exceeds twenty feet in height, while northward it is a fine tree 100 feet high or more, with a trunk four to six feet in diameter. The timber is very valuable and much used for ornamental wainscoting and furnishing. This is the only *Lauracea* in Western North America, and it is a remarkable instance of decrescence in size from north to south,

the rule being, in the northern hemisphere, from south to north.

72. **Wellingtonia or Big Tree** (*Sequoia gigantea*, Dcne.). Western North America. See description of the picture 168.

73. **Sugar Pine** (*Pinus Lambertiana*, Dougl.). Western North America, throughout California and northward to the Columbia River. A lofty tree 150 to 300 feet high, with a trunk ten to twenty feet in diameter. It is stated in the *Botany of California* that the exudation of the partially burned tree loses its resinous qualities and acquires a sweetness similar to that of sugar or manna, for which it is sometimes used; hence the name Sugar Pine. 168.

74. **Indian Sandal Wood** (*Santalum album*, L.). Mysore, Canara, Ceylon. A small tree. 334.

75. **Buroon** (*Cratæva religiosa*, Forst.). India. A common tree having a soft tough wood used for carving.

76. **Trincomalee Wood** (*Berrya Ammonilla*, Roxb.). Ceylon. This is considered one of the most useful timber trees of Ceylon.

77. **Palla Wood** (*Mimusops indica*, A.DC.). Ceylon. Used for ordinary building purposes. No. 338 is a painting of another species of the genus.

78. **Nauladi-mara** (*Vitex altissima*, L.). Ceylon, South India.

79. **Suriya** (*Thespesia populnea*, Corr.). A very widely dispersed tree in tropical countries. It is of medium size, and the wood is greatly esteemed for boat-building, as it is almost indestructible under water. For

cabinet making it is also in demand, and gunstocks were formerly made from it in Ceylon. Painting 270.

80. **Kakkar** (*Pistacia integerrima*, Stewart). North-west India. Dr. Brandis states that the heart-wood of mature trees is the best and most handsome wood of the North-west Himalaya for carving, furniture, and all kinds of ornamental work. A tree of forty or more feet in height, trunk eight to nine, more twelve to fifteen feet girth.

81. **Ceylon Satin-wood** (*Chloroxylon Swietenia*, DC.). South India, Ceylon. In point of size and durability, Drury states this is by far the first of the timber trees of Ceylon. At Peradeniya a bridge of a single arch 205 feet in span, chiefly constructed of satin-wood, crosses the Mahawalliganga river.

82. **Arjun** (*Terminalia Arjuna*, Bedd.). North-western India to Ceylon. A tree attaining 80 to 100 feet in height. The timber used for carts, agricultural implements and building. Paintings 229 and 340 represent other species of *Terminalia.*

83. **Dawata-gass** (*Carallia integerrima*, DC.). Tropical Asia and Australia. This is a member of the Mangrove family (*Rhizophoreæ*). Timber described as rather brittle but very ornamental, with broad medullary rays, which show on a vertical section like undulating broad irregular bands, giving the wood a beautiful mottled appearance.

84. **Gutta Percha** (*Dichopsis Gutta*, Benth., syn. *Isonandra Gutta*, Hook). Indian Archipelago. It is now about forty years since Gutta Percha came into use, and the tree has entirely disappeared from the island of Singapore, where it was formerly common. Happily it exists in Borneo and other countries. 426.

85. **Surija-mara** (*Albizzia Lebbek*, Benth.). Tropical Asia, &c. This tree is cultivated in nearly all tropical countries on account of its ornamental appearance. It is one of the trees of the avenues of Cairo. Painting 321.

86. **Tamarind** (*Tamarindus indica*, L.). Cultivated throughout India, though probably not an indigenous tree. It is believed to be indigenous in tropical Africa and North Australia. The timber is highly prized for turnery. Paintings 289 and 522.

87. **Babul** (*Acacia arabica*, Willd.) Tropical and sub-tropical Asia and Africa. A small tree valuable not alone for its hard wood, but also for its gum. Indeed almost every part of it is useful.

88. **Cocoa Nut** (*Cocos nucifera*, L.). Tropics. See the descriptions of the paintings 174, 243, and 265. The wood is used for ornaments and fancy articles, and is commonly called Porcupine wood.

89. **Champak** (*Michelia Champaca*, L.). India. A handsome evergreen tree, 60 to 100 feet high. Wood takes polish well, and is prized for furniture and carriage building. 315.

90. **Indian Sandal-wood** (*Santalum album*, L.). India. See panel 74 and picture 334.

91. *Magnolia*, sp. India.

92. **Coromandel wood** (*Diospyros quæsita*, Thwaites). South India and Ceylon. This a kind of ebony.

93. *Hopea odorata*, Roxb. Burma.

94. **Nadoong** (*Pericopsis Mooniana*, Thwaites, syn., *Dalbergia Mooniana*, Thwaites). Ceylon.

95. **Toon** (*Cedrela Toona*, Roxb.). South India, and cultivated in other parts. See the description of *C. odorata*, panel 26.

96. **Tamarind** (*Tamarindus indica*, L.). See description of panel 86.

97. **Babul** (*Acacia arabica*, L.). See description of panel 87.

98. **Red Saunders** (*Pterocarpus santalinus*, L. fil.). India. A tree of the Western Peninsula.

99. **Nadoong** (*Pericopsis Mooniana*, Thwaites). Ceylon.

100. **Ebony** (*Diospyros ebenum*, Kœn.). South India and Ceylon. There are several kinds of ebony in commerce, but this is the best of them all.

111. **Ceylon Satin-wood**, (*Chloroxylon Swietenia*, DC.). See the description of panel 81.

102. **Gumhar** (*Gmelina arborea*, Roxb.). South India. A small tree, yielding a light wood used by the natives for making the cylinders of their drums, &c.

103. **Jak** (*Artocarpus integrifolia*, Willd.). Tropical Asia. A large tree, the wood of which is extensively used for making furniture of all kinds. See the description of picture 360.

104. **Karambru** (*Albizzia odoratissima*, Benth.). Tropical Asia. A large and handsome tree, with a hard wood used for naves, spokes, fellies, &c.

105. *Cassia siamea*, Lam. Tropical Asia.

106. *Albizzia odorotissima*, Benth. The same as 104.

107. **Talipot** (*Corypha umbraculifera*, L.). The trunk of this Palm sometimes attains a height of 100 feet, and it is one of the most majestic of its tribe; but the wood is of little value. Consult the descriptions of the pictures 304 and 492.

108. **Tamarind** (*Tamarindus indica*, L.) See the description of panel 86.

109. **Walsappoo** (*Michelia nilagirica*, Zenk.) South India.

110. **Gumhar** (*Gmelina arborea*, Roxb.). The same as 102.

111. **Common Walnut** (*Juglans regia*, L.). India. The walnut is common in the mountain region of North-west India.

112. **Champak** (*Michelia Champaca*, L.). See panel 89.

113. **Wine Palm** (*Caryota urens*, L.). Tropical Asia. This is described at length, picture 492.

114. **Ceylon Satin-wood** (*Chloroxylon Swietenia*, DC.) See panel 81.

115. "**Ran.**" India.

116. No name. India.

117. "**Hodar.**" India.

118. "**Aum.**" India.

119. No Name. India.

120. "**Mhinthal.**" India.

121. *Stephegyne parvifolia*, Korth. India. A small tree of the order *Rubiaceæ*.

122. *Shorea stellata*, Dyer, syn. *Parashorea stellata*, Kurz., Burma. A lofty evergreen tree, 120 to 150 feet high.

123. No Name. India.

124. **Cocoa Nut** (*Cocos nucifera*, L.). Consult the descriptions of paintings 170 and 243.

125. **Jak** (*Artocarpus integrifolia*, Willd.). The same as panel 103.

126 to 140. **Bornean Woods**, which we have no means of identifying.

141. **Tamanu** (*Calophyllum Inophyllum*, L.). Tropical Asia.

142. **Keaki** (*Zelkova keaki*, Sieb.). Japan. A small tree allied to the Elms.

143. Undetermined. New Zealand.

144 and 145. Unnamed.

146. **Totara** (*Podocarpus Totara*, A. Cunn.), New Zealand. "The most valuable timber of New Zealand."

147. Undetermined.

148. **Matai or Black Rue** (*Podocarpus spicata*, R. Br.). New Zealand. Also a valuable timber. A tree eighty or more feet high.

149. **Kauri** (*Dammara australis*, Lamb.). New Zealand. This Conifer is, perhaps, the tallest tree in the island, rising to a height 120 feet, with a trunk sometimes ten feet in diameter.

150. **Rata** (*Metrosideros robusta*, A. Cunn.). New Zealand. A tree of the Myrtle family, fifty to sixty feet high, furnishing a hard close-grained timber. See the pictures 536 and 543 for other species of the genus.

151. Undetermined. Tasmania.

152. Undetermined. Tasmania.

153. **Sassafras** (*Atherosperma moschata*, Labill.). Common in Tasmania, rare in Victoria. It is a large tree commonly associated with Beech.

154 and 155. **Myrtle Beech** (*Fagus Cunninghamii*, Hook.). Tasmania and Victoria, common in the former country and constituting the greater part of the forest in some parts of the mountainous districts, 537 and 583.

156. **Mottled Kauri** (*Dammara australis*, Lamb.). New Zealand. See panel 149.

157. Undetermined. Tasmania.

158. **Celery-topped Pine** (*Phyllocladus rhomboidalis*, Rich.). Tasmania. A slender tree sometimes sixty feet high, but reduced to a shrub high up in the mountains. 537 and 952.

159. *Athrotaxis cupressoides*, Don. Tasmania. A tree of twenty to forty feet, with a relatively thick trunk, sometimes as much as fifteen feet in girth.

160. **Blackwood** (*Acacia melanoxylon*, R. Br.) Australia. This is an exceedingly hard heavy wood. The tree is widely spread in eastern and southern Australia, and attains a very large size. *A. dealbata* (picture 548) is an allied species.

161. **Huon Pine** (*Dacrydium Franklinii*, Hook. f.). Tasmania. A tree sixty to eighty, or sometimes as much as 100 feet high.

162. **Australian Red Cedar** (*Cedrela australis*, R. Br.). Queensland and New South Wales. A handsome tree, perhaps not specifically different from the Indian *C. Toona*, panel 95.

163. **She Oak** (*Casuarina Fraseriana*, Miq.). West Australia. This genus is a prominent feature in Australian vegetation, but most of the species are small or only medium size trees. 523, 550, and 614.

164. **Raspberry Jam or Myall** (*Acacia acuminata,* Benth.). West Australia. A tree of medium size, whose wood is said to smell like raspberry jam.

165. **Australian Sandal-wood** (*Fusanus spicatus,* R. Br.). West Australia. A tree about thirty feet high, represented in paintings 556 and 587.

166. **Raspberry Jam** or **Myall** (*Acacia acuminata,* Benth.) Same as panel 164.

167. **She Oak** (*Casuarina Fraseriana,* Miq.). Same as panel 163.

168. **Tuart** or **Tooart** (*Eucalyptus gomphocephala,* DC.). West Australia. This is one of the medium-size gum trees, its greatest known height being 120 feet, but it is usually much smaller.

169. **Yarrah** or **Mahogany** (*Eucalyptus marginata,* Sm.). West Australia. This forms the principal forests of South-western Australia, rising exceptionally to a height of about 150, good-size trees averaging 150 feet. For further information respecting the species of this genus, consult the descriptions of the pictures 568, 573, and 604.

170. *Frenela,* sp.? West Australia.

171. **Red Gum** (*Eucalyptus calophylla,* R. Br.) West Australia. This is one of the handsomest of the genus. See picture 579.

172. **She Oak** (*Casuarina Fraseriana,* Miq.). Same as panel 163.

INDEX.

(The Numbers refer to the Pictures).

ABYSSINIAN Aloe, 616
Acacia alata, 551
— armata, 600
— catechu, 340
— cyclopis, 575
— dealbata, 547, 548
— false, 213
Acanthacea, 120
Acer palmatum, p. 76
Achras Sapota, 427
Aciphylla, 545
Acrocomia, 94, 134
Actinotus Helianthi, 581
Adam's Needle, 621
Adansonia digitata, 276 289
Ægle Marmelos, 313
Aeranthes funalis, 125
Æschynanthus bracteata, 286
— longiflora, 349
Agalmyla staminea, 486
Agapornis pullaria, 36
Agave americana, 19, 38, 518
Agonis flexuosa, 579
Air Plant, 54, 153
Aithurus polytmus, 137, 138
Akee, 151
Akunda, 337
Albizzia Lebbek, 321
Alligator Pear, 430
Allspice, 178
Almond, Indian, 229

Almond, Java, 439
Aloe, Abyssinian, 616
— American, 19, 38, 518
— barbadensis, 20
— vera, 20, 35
— vulgaris, 20
Alpinia nutans, 137, 171
— magnifica, 65
Alsophila australis, 554
Amaltas, 277
Amatia, 142
Amblypodia, 358
Amherstia nobilis, 416
Amomum magnificum, 65
— sp. 497
Amoora aphanamixis, 397
Amorphophallus campanulatus, 495
Ampelopsis tricuspidata, p. 76
Anacardium occidentale, 233
Anæctochilus, 412
Ananas sativus, 246
Andromeda Mariana, 208
Angræcum funale, 125
Anigozanthus flavida, 598
— Manglesii, 562
Anona Cherimolia, 268
— muricata, 118
— reticulata, 352
Anopterus glandulosus, 552
Antechinus flavipes, 587
Anthocephalus Cadamba, 311

4r

ANT

Anthocercis viscosa, 572
Anthurium Andræanum, 620
Antigonon leptopus, 412
Antirrhinum Coulterianum, 217
Aphanamixis grandifolia, 397
Aphelandra, 157
Aphyllon uniflorum, 208
Apple, Mammee, 78
— Star, 121
Apricot South American, 78
Aprosmictus erythropterus, 592
Aquilegia canadensis, 208
— chrysantha, 217
Arachnanthe moschifera, 407
Araucaria Bidwillii, 585, 589, 595
— brasiliensis, 119
— Cunninghami, 560
— excelsa, 357
Areca Catechu, 320, 390, 423
— Northiana, 565
— Red, 357
— sapida, 544
Arenga saccharifera, 508
Argostemma, 267
Argyreia speciosa, 259
Arnatto, 174
Arisæma curvatum, 283
— speciosum, 293
— triphylla, 206
— utile, 293
Aristolochia brasiliensis, 46
— Goldieana, 618
Aristotelia peduncularis, 533
Artocarpus incisa, 347
— integrifolia, 360
Arundo conspicua, 536
— Donax, 15
Asclepias curassavica, 139
Asoka, 335
Aspilia, 30, 58
Asplenium Nidus-avis, 554
Atkinsonia ligustrina, 586
Atlas Moth, 84
Attalea, 55
Aubergine, 437
Aucuba japonica, 481

BIG

Averrhoa Bilimbi, 166
— Carambola, 358
Avocado Pear, 430
Azadirachta indica, 255, 273, 326
Azalea, 213
— nudiflora, 208

BACILLI, 498
Bactris, 173
Bacularia monostachya, 554
Bail, 313
Bamboo, 85, 162, 324, 375, 500
— Abyssinian, 232
Bambusa, 162
— abyssinica, 232
— arundinacea, 324
Banana, 8, 134, 239
Banksia attenuata, 597
— coccinea, 594
— grandis, 606
Banyan, 339, 487, 499
Baobab, African, 276, 289
Barringtonia speciosa, 418
Bartonia conferta, 572
Basil, Holy, 319
Bassia latifolia, 330
Bauhinia variegata, 235
Bead Tree, 139
Bear, Australian, 557, 614
Beaufortia decussata, 551
Beaumontia grandiflora, 482
Beech, New Zealand, 537
Begonia argyrostigma, 95
— maculata, 95
— sp. 381
Belideus flaviventris, 568
Bellendena montana, 552
Benthamia fragifera, 382
Berberis vulgaris, p. 76
Betel Pepper, 320
Bignonia æquinoctialis, 87
— undulata, 247
— unguis, 285
— venusta, 91
Big Tree, 168, 185, 227, 228

BIL

Bilimbi, 166
Billardiera longiflora, 533, 552
Billbergia zebrina, 153
Bird, Blue, 95
— Diamond, 542
— -orchid, 436
Bixa Orellana, 174
Black Boy, 563
— Butt, 563
— Fern, 626
Blighia sapida, 151
Blimbing, 166
Blue Bird, 95
— Gum, 542, 547
Bombax malabaricum, 261
Borassus flabelliformis, 269, 524
Borbora, 42
Boronia, 581
Bottle Tree, 558
Bougainvillea, 59, 122
— spectabilis, 194
Bramble, sandal-wood, 123
Bread Fruit, 347
Broomrape, naked, 208
Broughtonia sanguinea, 161
Brownea coccinea, 258
Brugmansia arborea, 61
Brunfelsia Hopeana, 165
Bryophyllum calycinum, 196
Bugloss, 23
Bulbine, 566
Bulimus, 156
Bullock Heart, 352
Bunya-Bunya, 585, 589, 595
Buriti Palm, 119
Butea frondosa, 333
Butter, Midshipman's, 430
Butterfly, Sulphur, 128
Butterfly, Swallow-tail, 87
Byblis gigantea, 577

CABAZINA Pear, 68
Cabbage Tree, 545
Cacatua, 584
Cadamba311,

CAT

Cæreba cyanea, 95
Calabash Tree, 125, 158
Caladium, 161
— esculentum, 178
Calamus, 242, 515, 434
Calanthe vestita, 415
Calceolaria, 230
Calico Bush, 213
Callicore Clymene, 81
Callidyas philea, 128
Calliphlox amethystina, 129
Callistemon lanceolatus, 571
— salignus, 538
— speciosus, 598
Callitris, 603
Calochortus venustus, 217
Calotropis gigantea, 337
Calyptomena Rafflesii, 348
Calyptorhynchus Banksii, 612
Camellia, 461
Camellia japonica, 481
— theifera, p. 76
Camphor Tree, 465
Cananga odorata, 341, 346
Canarina Campanula, 36
Canarium commune, 431, 439
Canary Bird, 34
Cancer Root, 208
Candle Tree, 474
Canna Ehemannii, 622
Cape Weed, 564
Carambola, 358
Carica Papaya, 50, 105, 522
Carnivorous Plants, 226
Caryophyllus aromaticus, 510
Caryota urens, 402, 492, 504
Cashew Nut, 233
Cassia alata, 520
— corymbosa, 47
— Fistula, 277
— nodosa, 302
Castilleia affinis, 217
Castor Oil Plant, 115
Casuarina, 523, 550, 614
Catagramma, 81
Catchfly, 222

Catechu, Indian, 340
Cattleya, spp., 28, 98, 107, 110
Cecropia peltata, 40
Cedar, Indian, 252
Cedrus Deodara, 252, 328
Celery-topped Pine, 537
Celmisia coriacea, 536
Centaury, 217
Cephalotus follicularis, 566
Cereals, Indian, 238
Cereus, 131
— cærulescens, 619
— giganteus, 199
Ceropegia, 472
Chamæbatia foliolosa, 224
Champak, 315
Cheiranthera filifolia, 566
Cherimoyer, 268
Cherokee Rose, 22, 59
Cherry, Australian, 552
Chia, 217
Chinese Banana, 8, 239
Chirita urticæfolia, 305
Chlorostilbon, 110
Chorisia speciosa, 111
Chrysanthemum, 463, 483
Chrysophyllum Cainito, 121, 175
Chumpa, 315
Cinchona Calisaya, 409
Cineraria, 16, 21
— cruenta, 16
Cinnamomum, 493
— Camphora, 465
— zeylanicum, 141
Cinnamon Tree, 141
Cissus discolor, p. 76
— porphyrophyllus, 438
Citron, 200
Citrus Aurantium 53
— Decumana, 374
— medica, 200
Claytonia perfoliata, 224
Clematis, p. 41
Clerodendron Bethuneanum 361
— fallax, 403
— Thomsonæ, p. 41

Clianthus Dampieri, 540
— puniceus, p. 76
Clitoria Ternatea, 179, 493
Clove, 510
Clusia, 71
Clytolæma rubinea, 122
Coachman's Whip Bird, 593
Cobœa scandens, p. 116
Cobra Plant, 283
Coccocypselum discolor, 95
Coccus Cacti, 5
Cochineal Cactus, 20
— Gardens, 5, 15
— Insect, 5
Cockatoo, Black, 612
Cock of the Rock, 348
Cocoa Nut Palm, 170, 243, 265
— Tree, 354
Coco de Mer, 488
Cocos nucifera, 170, 243, 265
Codonanthe Hookeri, 28
Coelogyne Lowii, 349
— pandurata, 349
Coffea arabica, 167
— liberica, 167
Coffee, 167
Collinsia bicolor, 217
Columba livia, 282
Columbine, 208, 217
Comesperma volubile, 606
Companion Bird, 550
Comparettia coccinea, 92
Conospermum triplinervium, 562
Conostylis, 566
Cookia punctata, 237
Coquito Palm, 425
Coral Snake, 56
— Tree, 112, 165
— Tree, Indian, 318
Cordia, 179
Cordyline, 545, 576
Corn, Indian, 238
Cornus capitata, 382
Cornus Nuttallii, 204
Correa, 581
Corynocarpus lævigata, 543

Corypha umbraculifera, 304, 492
Costus speciosus, 520
Cotton Plant, 121
— Tree, 143
— Tree, Red, 261
Cowslip, American, 222
Crawfurdia speciosa, 263
Creoxyli, 498
Crescentia Cujete, 125, 158
Crinum augustum, 371, 421
Crinum Northianum, 421
Crotalaria, 519
Crotophaga major, 90
Cryptomeria japonica, 478
Cryptostemma calendulacea, 564
Cucurbita digitata, 199
Curcuma zedoaria, 472
Currajong, 601
Cuscuta americana, 43
Custard Apple, 352
Cyathea medullaris, 626
Cyathodes glauca, 552
Cycas, 41
— revoluta, 473
Cyclobothra, 222
Cymbidium pendulum, 349
Cynometra cauliflora, 359, 369
Cyphomandra betacea, 76
Cypripedium acaule, 208
— Hookeræ, 417
Cypripedium Lowii, 417
— parviflorum, 206

DACRYDIUM Colensoi, 536
Daviesia, 581
Damask Rose, 22
Darlingtonia californica, 226
Date Palm, 24, 41
Datura alba, 323
— arborea, 61, 146, 241, 511
— sanguinea, 161
Delabechea rupestris, 558
Delphinium variegatum, 217
Dendrobium Jenkinsii, 307
— secundum, 450
Dendrobium superbum, 307, 415
Deodar, 252, 278, 300
Dhak, 333
Diadema bolina, 418
Diamond Bird, 542
Dichopsis Gutta, 426
Dicksonia antarctica, 537
Didymocarpus reticosus, 446
Dionæa muscipula, 226
Diospyros Kaki, 491
Dipladenia crassinoda, 13
—Harrisii, 73
Dipteracanthus, 58
Dipterocarpea, 353
Dischidia, 446
Diuris, 581.
Dodder, 43
Dodecatheon Meadia, 222
Doryanthes Palmeri, 600, 627
Doryphora Sassafras, 533, 547
Double Cocoa Nut, 488
Douglas Fir, 210
Dracophyllum Traversii, 534, 536
Dracunculus canariensis, 21
Dragon or Dragon's Blood Tree, 6, 10, 12, 32, 37
Drymophila, 552
Durian, 357, 366
Durio Zibethinus, 357, 366
Dyckia remotiflora, 157

ECHINOPSIS oxygona, 230
Echium simplex, 23
Egg Plant, 437
Eichornia azurea, 27
Elaps, 56
Elæis guineensis, 50
Elephant Creeper, 259
Eleusine coracana, 238
Emblica officinalis, 332
Emu, 604
Emu Wren, 556
Ensete, 18
Epacris longiflora, 564
Epidendrum cochleatum, 194

EPI

Epiphyllum, 156
Epistephium sclerophyllum, 156
Eragrostis cynosuroides, 331
Eria, 356
Erica arborea, 16
Eriodendron anfractuosum, 143
— orientale, 454, 485
Eriostemon, 581
Erythræa venusta, 217
Erythrina, 112, 114, 165
Erythrina indica, 318
Erythrospiza, 287
Escobedia scabra, 157
Eucalyptus amygdalina, 568, 599, 608
— calophylla, 579
— cordata, 552
— diversicolor, 604
— ficifolia, 611
— Globulus, 542, 547
— macrocarpa, 573
— marginata, 584
— obliqua, 591
— paniculata, 570
— piperita, 592
— tetraptera, 613
Eugenia, 128
Eugenia Jambos, 194
— malaccensis, 456
Euphorbia canariensis, 4,
— pulcherrima, 74
— splendens, 183
Eurya japonica, 461
Eurybia argophylla, 583
Euterpe, 127
Evolvulus, 120
Exocarpus cupressiformis, 552

FAGRÆA, 449
— auriculata, 517
Fagus Cunninghamii, 537, 583
False Acacia, 213
Fatsia papyrifera, 470
Fern, Stagshorn, 420
Ficus bengalensis, 339, 487, 499
— Benjamina, 442, 512

GRI

Ficus elastica, 274, 451
— glomerata, 325
— religiosa, 282, 329
Fir, Douglas, 209
Fire Tree, 586, 588
Fishbone Tree, 546
Flame Tree, 586, 588
Flannel Flower, 81
Flax, New Zealand, 535
Flor de Pasqua, 74
Flor Imperiale, 56
Flycatcher, longtailed, 261
Flying Opossum, 568
Forsythia, 461
Fouquiera splendens, 199
Franciscea Hopeana, 165
Fangipani, 100, 184
Frenela rhomboidea, 531
Frog, Tree, 154
Fusanus spicatus, 556, 587

GAMOGYNE Burbidgei, 438
Garcinia Mangostana, 379, 399
— Xanthochymus, 419
Gardenia, 161
Gaultheria hispida, 533
Gaylussacia resinosa, 206
Geranium maculatum, 206
Gerardia, 217
Globba, 459
Gloriosa superba, p. 40
Glory Pea, 540
Gool-achin, 322
Gompholobium polymorphum, 594
Gomphrena officinalis, 101
Gossypium barbadense, 121
— herbaceum, 121
— peruvianum, 121
Gourka, 419
Granadilla, 51, 126
Grass Trees, 531, 578, 586
Grevillea Banksii, 584
— bipinnatifida, 577
— leucopteris, 602
Grias cauliflora, 180

Guaiacum officinale, 182
Guaresma, 135
Guava 176
Guianga, 42
Gulf Weed, 177
Gum, Blue, 542, 547
— Red, 563
— White, 581
Gutta Percha, 462

HABENARIA, 267
Hæmanthus multiflorus, 56
Hæmatoxylum campechianum, 174
Hakea cucullata, 613
— cyclocarpa, 613
Hedychium chrysoleucum, 86
Heliconius Phyllis, 64
Heliotropium indicum, 194
Helipterum Manglesii, 577
Hennah, 374
Hexacentris coccinea, 284, 290
Hibiscus Cooperi, 530
— esculentus, 42
— heterophyllus, 601
— Huegelii, 613
— Rosa-sinensis, 194
— Sabdariffa, 528
Hippeastrum Reginæ, 194
Holy Basil, 319
— Tree, 139
House-builder Caterpillar, 44
Houseleek, 34
Huckleberry, Black, 206
Humming Birds, 73
— Bird, Californian, 204
— — Doctor, 137, 138
— — Double-crested, 111
— — Amethystine, 129
Hydrangea altissima, 299
— sp. 519
Hylà, 154
Hypocyrta gracilis, 28

IMPATIENS, 263, 519
Indaia Palm, 55
Indian Laburnum, 277
— Rubber, 274
— Shot, 622
— Turnip, 206
Indigofera, 382
Iochroma, 36
Ipomœa, Batatas, 42
— Bona-nox, 494
— jalapa, p. 40
— mutabilis, 194
— Pes-capræ, 365
— purpurea, 196
— Quamoclit, 120
Iresine Herbstii, 120
Iris, 513
Iron Wood, 264, 285
Isonandra Gutta, 426
Isotoma Brownii, 577
Ivy, Tasmanian, 552
Ixora coccinea, 410

JAK Fruit, 360
Jasminum gracillimum, 381
Jessamine, Night, 316
Johnsonia lupulina, 572
Jonesia Asoca, 335
— declinata, 505
Jubæa spectabilis, 425
Juniperus virginiana, 221

KAKI, 491
Kalmia latifolia, 213
Kanari, 431, 439
Kangaroo, 595
— Feet, 562
— Rat, 532
Karaka, 543
Karri Gum, 604
Kawa Kawa, 544
Kennedya coccinea, 572
— nigricans, 588
Kentia minor, 565
Kid-glove Plant, 536
Kigelia pinnata, 245

KIN

Kingia australis, 563, 578
Kleinia, 7
Koala, 557
Kuddum, 311

LABURNUM, Indian, 277
Lady's slipper, 206, 208, 253
Lælia purpurea, 116
Lagerstrœmia indica, 467
— Flos-Reginæ, 161, 271
Lambertia echinata, 551
Lampornis, 61
— violicauda, 142
Lansium, 388
Lapageria rosea, p. 40
Laportea moroides, 603
Laurel, Mountain, 213
Lawsonia inermis, 374
Layia platygossa, 217
Leaf Insect, 47, 498
Leather Plant, 536
Leonotis nepetæfolia, 138
Leptospermum lævigatum, 574
— scoparium, 574
Leschenaultia biloba, 572
Leucopogon vorticillatus, 579
Lignum Vitæ, 182
Lilac, Tasmanian, 552
— Persian, 139
Lilium auratum, 624
— Wallichianum, 305
Lily, Mariposa, 217
Liriodendron tulipifera, 213
Lisianthus inflatus, 157
— pulcherrimus, 157
Lissanthe strigosa, 552
Lithophragma heterophylla, 224
Livistona australis, 549, 582
Lizard, Flying, 374
Lobelia, 566
Locust Tree, 213
Lodoicea Seychellarum, 488
Logwood, 174
Lonicera sempervirens, 296
Lophornis magnificus, 73

MEY

Loquat, 142, 169
Loranthus aurantiacus, 570
— pendulus, 556
Lotus, Sacred, 314
Luhea rufescens, 91
Lyre Bird, 569

MACADAMIA ternifolia, 612
Macrosiphonia longiflora, 81
Macrozamia Fraseri, 563
— spiralis, 541
Magnolia grandiflora, 109
— obovata, 625
— purpurea, 625
Mahoe, 132
Mahogany, Australian, 584
Mahwah, 330
Maize, 238
Malurus malacurus, 556
Mammee, 78
Mammea americana, 78
Mammoth Tree, 168, 185, 227, 228
Mandioc, 341
Mangifera indica, 327, 510
Mango, 310, 327, 510
Mangosteen, 379, 399
Mangrove, 385
Manihot utilissima, 341
Marica, 84
Mariposa Lily, 217
Mauritia flexuosa, 119
— vinifera, 119
Meconopsis Wallichii, 266, 275
Medinilla magnifica, 350
Medlar, Japanese, 142, 169
Megalæma, 517
Melaleuca Leucadendron, 538
Melia Azedarach, 139
Mellisuga minima, 133
Menura superba, 569
Mesua ferrea, 264, 285
Metrosideros lucida, 536
— tomentosa, 543
Meyenia, 194
— erecta, 414

Michelia Champaca, 315
— excelsa, 291
Millet, 238
Millingtonia hortensis, 306
Mimosa sensitiva, 408
Mimulus glutinosus, 217
Mimusops Elengi, 338
Monkey Flower, 217
Morpho achillæna, 13
Morpho laertes, 29
Moth, Atlas, 84
Moth-Orchid, 412
Mountain Laurel, 213
Mucuna, 113
Mudar, 337
Musa chinensis, 8, 239
— coccinea, 518
— Ensete, 18
— paradisiaca, 134
— Sapientum, 134
Muscipeta paradisi, 261
Muscivora Swainsoni, 112
Musk Tree, 583
Mussænda macrophylla, 403
Mutisia speciosa, 29
Myristica fragrans, 133
— moschata, 133
Myrtle, Tree, 583

NATCHEE, 238
Nectarinia, 384
Neem, 255, 326
Nelumbium speciosum, 314, 506
Nepenthes, 377, 378
— destillatoria, 256
— Northiana, 383
— Rafflesiana, 392
Nephelium lappaceum, 355
Nerium odorum, 312
— Oleander, 139
Nicotiana Tabacum, 2
Nikau Palm, 544
Nipa fruticans, 370, 411
Notelæa ligustrina, 533
Nut, Cashew, 233
Nutmeg Tree, 133, 341
Nuytsia floribunda, 586, 588
Nyctanthes Arbor-tristis, 316
Nymphæa gigantea, 605
— Lotus, 364
— rubra, 864
Nyum-Nyum, 859

OAK, Darjeeling, 284
Ochro, 42
Ocimum sanctum, 319
Ocyalus, 106
Odontadenia speciosa, 73
Oil Palm, 50
Old Man's Beard, 54
Olea europæa, 3
Oleander, 139
Olearia argophylla, 583
Olive, 3
Oncidium, 65, 107
Opium Poppy, 615
Ophiopogon spicatus, 253
Oplismenus, 238
Opossum, Flying, 568
— Mouse, 587
Opuntia Dillenii, 36
— Tuna, 5, 20
Orange, 53
— loose-skinned, 281
Orchid, Moth-, 412
Orchids, 28, 39, 76, 92, 107, 116, 156, 307, 343, 349, etc.
Oreodoxa regia, 25, 77, 79, 99
— oleracea, 77
Oriole, Sociable, 106
Ornithoptera Priamus, 403
Ornithorhynchus paradoxus, 614
Orthocarpus purpurascens, 217
Orthopteron, 264
Oryza sativa, 455
Ostinops, 106
Ourang-Outang, 343
Oxytenanthera abyssinica, 232

PAC

PACHIRA marginata, 102
Padda orizivora, 503
Pæonia, 461
Palawen Tree, 387
Palma Christi, 115
— de Santa Rita, 84
Palm, Buriti, 119
— Cabbage, 127
— Cocoa Nut, 170, 243
— Cocoera, 94
— Coquito, 425
— Palmyra, 269, 524
— Royal, 77, 99
— Sago, 389
— Sugar, 508
— Talipot, 304
— Wine, 492
Palmyra Palm, 269, 524
Panax crassifolium, 546
— Gunnii, 552
— longissimum, 545, 546
Pancratium caribæum, 150
Pandanus, 80, 260, 514
— odoratissimus, 260, 514
Papaver somniferum, 615
Papaw Tree, 50, 105, 522
Paper-bark Tree, 538
Papilio Crino, 256
— bathycles, 302
— polydamas, 133
— polytes, 347
— Sarpedon, 319
— thoas, 87
Paritium elatum, 132
— tiliaceum, 132
Parochætus communis, 293, 519
Parrot, crimson and blue, 592
Parrot-flower, 540
Parson-bird, 546
Passiflora alata, 51
— macrocarpa, 126
— quadriglandulosa, 161, 237
Passion Flower, 51
Patersonia, 581
Peach, 103
Pear, Alligator, 430

PIN

Pear, Australian, 557
— Avocado, 430
— Cabazina, 68
— Wooden, 557, 561
Peepul, 273, 282, 329
Pentstemon azureus, 217
— centranthifolius, 217
Pepper, 435
— Betel, 320
Periandra dulcis, 71
Persea gratissima, 430
Persian Lilac, 139
Persimmon, Japanese, 491
Peruvian bark, 409
Petasophora serrirostris, 103
Petrophila, 572
Phacelia grandiflora, 217
— Whitlavia, 217
Phalænopsis amabilis, 412
Phascolarctos cinereus, 557, 614
Phasma, 498
Phasmidæ, 47, 498
Philodendron, 131
Phœnix dactylifera, 24, 41
Phormium tenax, 535
Phyllocladus rhomboidalis, 537, 552
Phyllium, 498
Physalis, 519
Physocalyx, 101
Picea Smithiana, 298
Pieris sp., 439
Pigeon, Blue, 282
Pimelea rosea, 572
— sp., 552
Pimento, 437
Pinanga, 393, 402
Pine Apple, 246
— Canary Island, 66
— celery-topped, 537
— Moreton Bay, 560
— Norfolk Island, 357
— Oyster Bay, 531
— Screw, 80, 260, 393
— Sugar, 168
Pinus canariensis, 66
— Lambertiana, 168

PIN

Pinus ponderosa, 209
Pinxter flower, 208
Piper Betel, 320
— excelsum, 544
— nigrum, 435
— sp., 438
Pitanga, 128
Pitcher Plant, Australian, 566
— Plants, Bornean, 377, 378, 383, 392
— Plant, Ceylon, 256
— —, Java, 484
Plagianthus Lyallii, 543
Plantain, 134
Plant of Life, 196
Platycerium grande, 420, 554
Platylobium triangulare, 564
Platypus 614
Pleione Wallichiana, 286
Pleroma, 30, 83
Plocidæ, 452
Plumeria, 184
— acutifolia, 322
Plum, Sapodilla, 427
Poinciana regia, 342
Poinsettia pulcherrima, 74
Pollia, 438
Polypodium, 356
Poma de Lupa, 117
Pomegranate, 17
Pomelloe, 374
Poplar, 223
Poppy, blue, 266
— opium, 615
Populus trichocarpa, 223
Porana grandiflora, 291
Portia Tree, 270
Portlandia grandiflora, 194
Pratia begoniæfolia, 486
Pride of India, 139
Prisopi, 498
Prostanthera lasianthos, 552
— sp., 552
Prosthemadera Novæ-zealandiæ, 546
Psidium, 68, 176
Psophodes crepitans, 593
Pterisanthes cissoides, 446

ROS

Pterospermum acerifolium, 272
Ptychosperma Cunninghamii, 582
Pudma, 314
Punica granatum, 17
Pyrameis, 115
Pyrus japonica, 481

QUAMOCLIT Nationis, 91
Quassia amara, 400
Quercus lamellosa, 284
— serrata, 287
Quisqualis indica, 414

RAMBUTAN, 355
Ranunculus Lyallii, 536
Raoulia eximia, 543
Rat, Kangaroo, 532
Rattan Palm, 242, 343
Ravenala madagascariensis, 72, 370
Red gum, 563
Redwood, 187, 218
Reed, Toe Toe, 536
Rhæo discolor, 408
Rhaphidophora decursiva, 503
Rhizophora Mangle, 385
Rhodanthe Manglesii, 577
Rhodochiton volubile, p. 41
Rhododendron arboreum, 257, 279
— argenteum, 248
— Aucklandii, 257
— blandfordiæflorum, 296
— formosum, 296
— Griffithianum, 257
— javanicum, 494
— niligiricum, 231
— varieties, 213
Rhopalostylis sapida, 544
Rice, 455
—paper tree, 470
Richea dracophylla, 533, 537
Ricinus communis, 115
Rosa lævigata, 22
Roscoea, 267
Rose Apple, 456

Rose Cherokee, 22
— Damask, 22
Roupellia grata, 79
Rourea, 404
Royal Palm, 25, 77, 79
Rubus australis, 543
— rosæfolius, 123

SACCHARUM officinarum, 26
Sago Palm, 389
Sagus lævis, 389, 432
— Rumphii, 389
Sal, 307
Salisburia adiantifolia, p. 76
Salt Bush, 551
Salvia carduacea, 222
— columbariæ, 217
Sandal wood, Australian, 556, 587
— — Indian, 334
Sandoricum indicum, 348
Santalum album, 334
Sapodilla Plum, 427
Saraca declinata, 505
— indica, 335
Sarcanthus, 417
Sarcodes sanguinea, 224
Sarcostemma aphylla, 336
Sargassum vulgare, 177
Sarracenia flava, 226
— purpurea, 226
Sassafras, 533, 547
Saturnia, 84, 493
Screw Pine, 80, 260, 393, 514
Seaforthia elegans, 582
Selasphorus rufus, 204
Sempervivum, 34
Sensitive Plant, 408
Sequoia gigantea, 168, 185, 227
— sempervirens, 187, 218
Serinus canarius, 34
Sesbania grandiflora, 447
Setaria, 238
Sheep, Vegetable, 543
She Oak, 550
Shooting Star, 222
Shorea robusta, 317
Side-saddle Flower, 226
Silene californica, 222
Silver-wattle, 547, 548
Sisyrinchium, 71
Smilacina racemosa, 206
Smoke Plant, 562
Snakewood Tree, 192
Snow Plant, 224
Soka, 416
Solandra grandiflora, 422
Solanum betaceum, 76
Solanum esculentum, 437
— sp., 117
Sollya heterophylla, 572
Solomon's Seal, 206
Soma-lata, 336
Sanchus, 14
Sophronitis coccinea, 39
— grandiflora, 31
Soursop, 118
Sparrow, White, 503
Spathodea campanulata, 160, 179
Spear Grass, 543
— Lily, Australian, 600, 627
Spiderwort, 217
Spikenard, False, 206
Stachytarpheta, 101
— mutabilis, 384
Stagger Bush, 208
Staghorn Fern, 420
Star Apple, 121, 175
Stenogaster concinna, 45
Stephanotis floribunda, p. 76
Sterculia, 372, 460
— coccinea, 344
— rupestris, 558
Stick Insects, 498
Stillingia sebifera, 474
Strelitzia Reginæ, 617
Stringy Bark, 591
Strobilanthes Wallichii, 267
Strophantus dichotomus, 467
Sturt's Pea, 540
Stylidium, 564
Styphelia, 581

SUG

Sugar Cane, 26
— Palm, 508
— Pine, 168
Susa, 411
Sweet Potato, 42
Syncarpia laurifolia, 532

TABERNÆMONTANA, 120
Tacca cristata, 355
Tacsonia mollissima, p. 116
— sanguinea, 161
Talipot Palm, 304, 492
Tamarindus indica, 289, 522
Tampoe, 348
Tappan Tree, 353
Teak, Bastard, 333
Tecoma australis, 568, 571
— undulata, 247
Telopea speciosissima, 607
— truncata, 552
Terminalia Catappa, 229
— citrina, 340
Tetratheca filiformis, 572
Thaw-ka, 416
Theobroma Cacao, 354
Thespesia populnea, 270
Thunbergia alata, 90, 183
— coccinea, 284, 290
— grandiflora, 449
— lutea, 299
Thysanotus, 572
Tillandsia, 148
— usneoides, 54
Tobacco, 2
Toe Toe, 53
Torenia asiatica, 286
Tradescantia discolor, 408
— virginica, 217
Traveller's Tree, 72, 320
Tree-heath, 16
Tree-lily, 136
Trichinium Manglesii, 577
Trichomanes reniforme, 543
Trillium grandiflorum, 217
Triteleia laxa, 217

XAN

Tropæa selene, 430
Trumpet Tree, 40, 186
Tulip Tree, 213
Tulsi, 319
Turnip, Indian, 206

UTRICULARIA, 286
— montana, 45
Uvaria odorata, 341, 346

VANDA cærulea, p. 76
— Lowii, 343
— suavis, 623
— teres, 378
Vanilla, 433
Vegetable Marrow, 430
Vegetable Sheep, 543
Vellozia, 69, 136
Venus's Fly Trap, 226
Veronica speciosa, 543
Victoria regia, 1.
Violet, 253
Vitis himalayana, 292

WAKE Robin, 217
Wampee, 237
Waratah, 607
Water Lilies, 60
Water Lily, Great, 1.
Wellingtonia gigantea, 168
Wigandia, 14
Wild Spaniard, 545
Wine Palm, 492
Wistaria chinensis, 465, 480
Whish-whish, 145
White Gum, 582, 591
Wooden Pear, 557, 561
Wormia excelsa, 367

XANTHORRHÆA, 531, 559, 578, 586

XAN

Xanthosia rotundifolia, 572
Xylomelum pyriforme, 561
— occidentale, 557
Xyris, 69

YARRAH, 584
Yucca, 14

ZYG

Yucca gloriosa, 621

ZEA Mays, 238
Zedoary, 472
Zephyranthes, 408
Zygopetalum Makayi, 98
— maxillare, 92

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